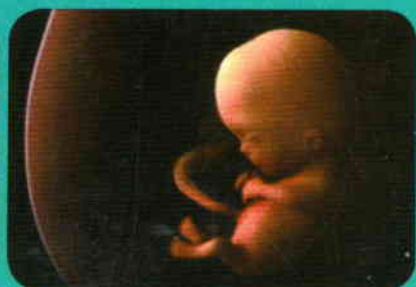
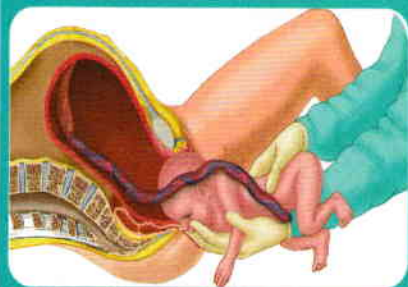


Elmandooh Gynecology and Obstetrics

OBSTETRICS

B



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Assistant Professor of gynecology and obstetrics
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B



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GYNECOLOGY AND OBSTETRICS is an ever-changing science. As a new research and clinical experience broaden our knowledge. Changes in investigations and treatment are required. The author and the publisher of this work have checked with sources believed to be reliable in their efforts to provide information that is complete and generally in accord with the standard at the time of publication.

We would like to thank Dr.El-Mandooh for that new edition of the book and for the effort done in preparing that edition.

Nonetheless, we thank him for choosing us as the publishing house for this valuable work, and indeed.

We are proud of publishing this book.

Dar El atebba team work

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PREFACE

My 2 Aims in this book to be SIMPLE and COMPLETE, so I save no effort for doing that.

It is hoped that the readers will find this book, presented in 4 volumes (**GYNECOLOGY A, B, OBSTETRICS A & B**), a useful source covering their necessary basic knowledge of **GYNECOLOGY AND OBSTETRICS**.

Your feedback and suggestions will be valuable to us, so we hope to contact us on Email

mandoohm@hotmail.com

Dr Mohamed Elmandooh

Chapter

1

Normal Labor

Fetal diameters

Pelvic diameters

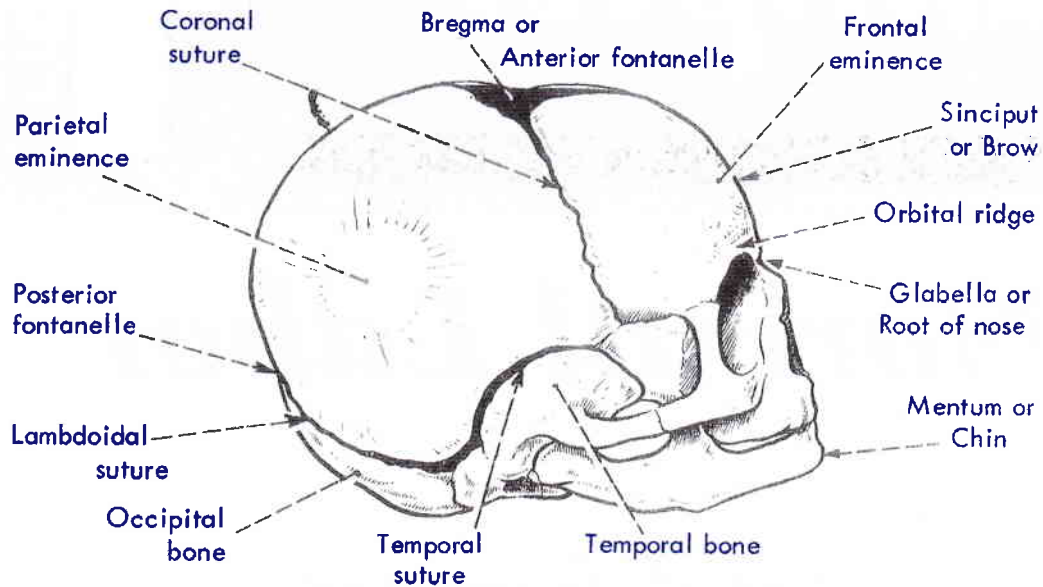
Uterine action

Mechanism

Management

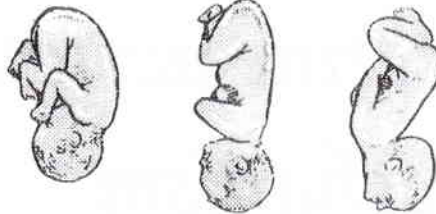
Partogram

FETAL SKULL

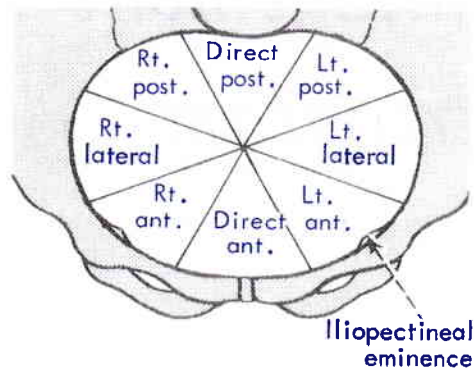


Attitude

Flexion Deflexion Extension



Positions



Components of Normal labor

- **P**ASSENGER.....(fetus)
- **P**ASSAGE.....(maternal pelvis + soft tissue)
- **P**OWER.....(uterine contractions + auxiliary forces)



Fetus



► Lie

- Relation between *longitudinal* axis of fetus & *longitudinal* axis of mother
- Either → - Longitudinal → 99.5 %
 - Transverse → 0.5 %
 - *Oblique* → crossing each other by 45° (rare: presenting part at an iliac fossa while the other part is at the opposite hypochondrium → spont. correction or obstructed labor)[□]

► Attitude

- Relation between fetal parts *to each other*
- Normally → generalized flexion of all joints (to **ACCOMMODATE** uterus)

► Presentation

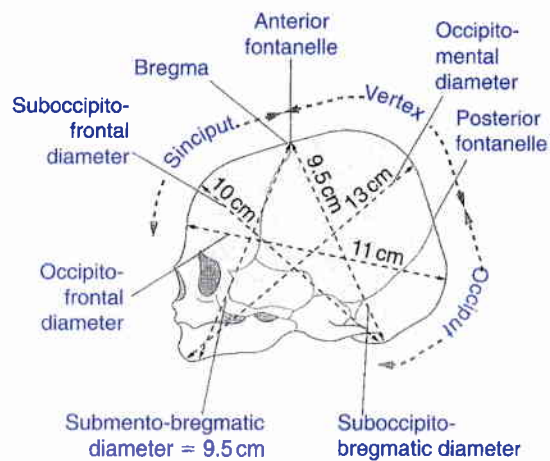
- Lowermost part of fetus which enters the pelvis first [□] (1st part felt by PV)
 - Cephalic* (96 %) --- *Breech* (3.5 %) --- *Shoulder* (0.5 %)
- Cephalic presentation may be
 - ♦ **Vertex** : from ant fontanelle + coronal suture
to post fontanelle + lambdoid suture
= two parietal bones + sagittal suture
bounded laterally by temporal sutures
 - ♦ **Brow** : from root of nose to anterior fontanelle
= two frontal bones + frontal suture
 - ♦ **Face** : from root of nose & supra-orbital ridge to chin

► Positions

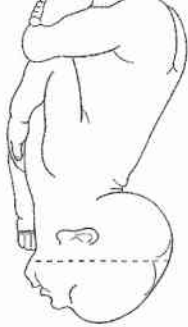
- Relation between the **denominator**
(a certain point on presenting part [□])
to the **maternal pelvis**
- There are **8 main positions**: each points to

Presentation	Denominator
Vertex	Occiput
Face	Mentum (chin)
Brow	Frontal bone
Breech	Sacrum
Shoulder	Acromion

Left ant. '1'	Lt iliopectineal eminence	Right post. '3'	Rt sacroiliac joint
Direct ant.	Symphysis pubis	Direct post.	Sacral promontory
Right ant. '2'	Rt iliopectineal eminence	Left post. '4'	Lt sacroiliac joint
Right lateral	Mid of iliopectineal line	Left lateral	Mid iliopectineal line



The diameters of the fetal skull

Flexed → Extended				
Attitude	Well flexed	Less well flexed (partially extended) or deflexed	Extended 'brow presentation'	Hyperextended 'face presentation'
Diameter	Suboccipito-bregmatic	Occipito-frontal	Occipito-mental	Submento-bregmatic
Measurement	9.5 cm	11.5 cm	13.0 cm	9.5 cm
				

The effect of fetal attitude on the presenting diameter

► Fontanelles (6th)

	Anterior fontanelle (<i>Bregma</i>)	Post. fontanelle (<i>lambda</i>)
Shape	- Diamond, large	- Triangular, small
Meeting of	4 sutures (frontal, coronal, sagittal) 4 bones (2 frontal, 2 parietal)	3 sutures (sagittal, lambdoid) 3 bones (2 parietal, 1 occipital)
Closure at	- 1.5 yrs (open 3 fingers at birth)	- Closed at FT infant at birth ^u

+ 2 ant. temporal fontanelles (at junct of temporal & coronal sutures)

+ 2 post. temporal fontanelles (at junct of temporal & lambdoid sutures)

► Transverse diameters of skull ^u

- Biparietal (the max. transverse diameter) = **9.5 cm**
- Bitemporal (between lower part of coronal suture) = **8.5 cm**
- Bimastoid (between mastoid processes) = **7.5cm** (not destroyable or reducible)
- Supraparietal-Subparietal = **9 cm**
(between a point above one parietal eminence to another point below opposite parietal eminence) → allows easier engagement in asynclitic head as it is less than the biparietal diameter

► Longitudinal diameters of skull ^u



* Suboccipito-bregmatic = **9.5 cm**

From below occiput to center of bregma (anterior fontanelle)

→ engaging diameter in occipito-anterior position in full flexion

* Suboccipito-frontal = **10 cm**

From below occiput to anterior end of bregma (post end of frontal bone)

→ engaging diameter in occipito-anterior position if head is not fully flexed

→ diameter distending the vulva after crowning

* Occipito-frontal = **11.5 cm**

From occipital protuberance to root of nose (ant end of frontal bone)

→ engaging diameter in occipito-posterior & after coming head of breach

→ diameter distending the vulva in face to pubis delivery

* Submento-bregmatic = **9.5 cm**

From below chin to center of bregma

→ diameter of engagement in fully extended face

* Submento-vertical = **11.5 cm**

From below chin to highest point between ant. & post. fontanelles

→ diameter of engagement in face if not fully extended

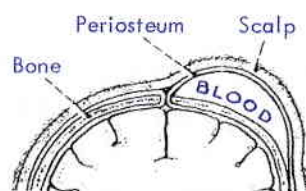
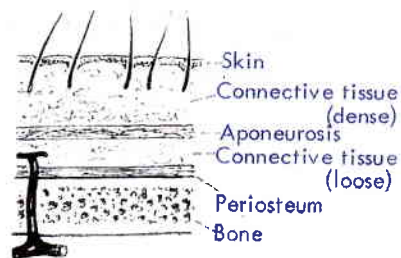
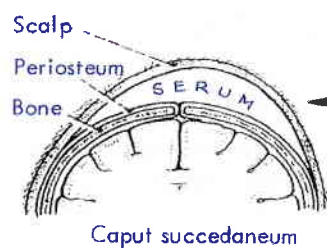
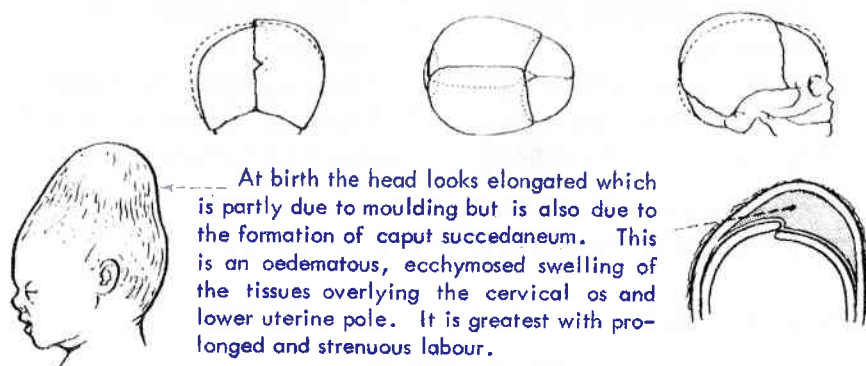
→ diameter distending the vulva in face delivery

* Mento-vertical = **13.75 cm** (LARGEST DIAMETER)

From chin to midway between anterior & posterior fontanelles

→ diameter of engagement in brow

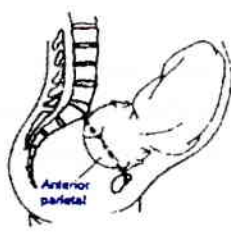
MOULDING OF THE HEAD



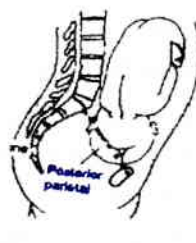
Cephalhaematoma



Synclitism



Anterior parietal presentation



Posterior parietal presentation

Types	Ant. parietal bone presentation "Naegel's obliquity"	Post. parietal bone presentation "Litzmann's obliquity"
Parity: > in	MP	PG
Sagittal suture	Closer to promontory	Closer to symphysis pubis
Lower level	The anterior parietal bone	The posterior parietal bone

THE ANTERIOR PARIETAL BONE PRESENTATION IS MORE FAVORABLE

- * As the head has already passed the SP (large surface) & only the sacral promontory is left to pass (thin edge)
- * Ut. cont. improves ant present. (as the head lies in direction of pelvic axis) but worsen the post.

► Effects of labor on skull (3)

①. Moulding (reshaping)

- **Def.** ⇨ overriding of the bones of fetal skull (d.t. ↓ CSF)
- **Adv.** ⇨ it allows some reduction of diameters of fetal skull (0.5–1cm)
- **Disadv.** ⇨ if excessive → it may lead to ICHge (esp 3rd)

Order of moulding	Grades of moulding
1 st parietal bones overlap each other → then overlap occipital bone → very late frontal bones	1 st → approximation of sutures 2 nd → overlap but reducible 3 rd → overlap but irreducible

②. Caput succedaneum [■]

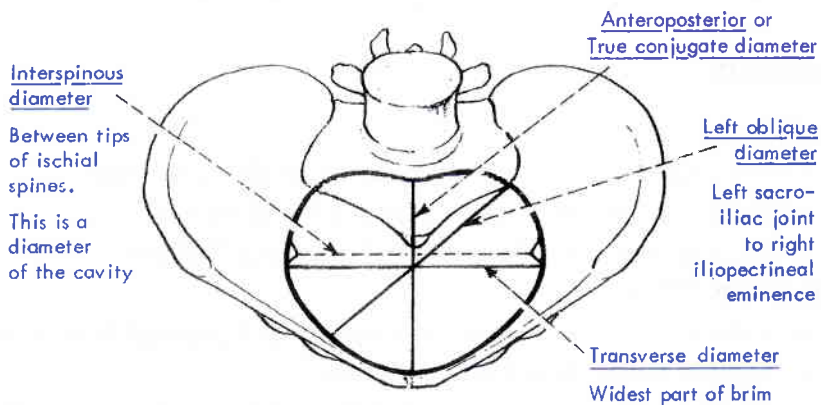
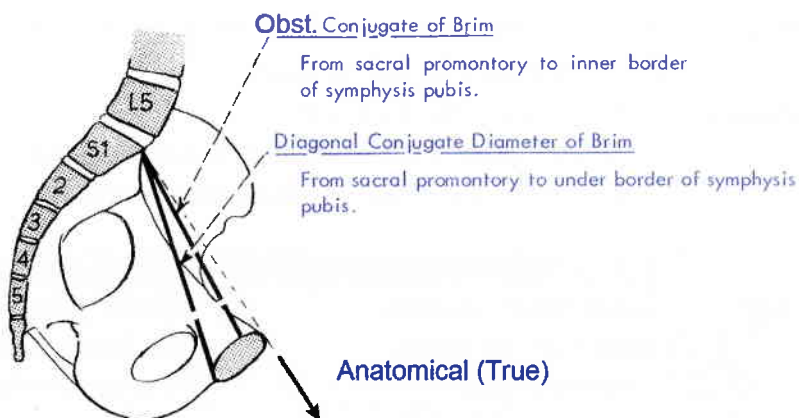
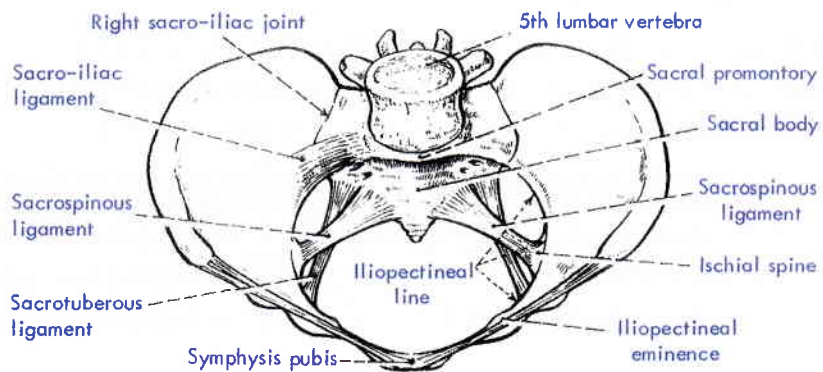
- **Def.** ⇨ edema over the presenting part → due to venous obstruction
- **Types** ⇨ 1. localized (*spontaneous* –cervical– or *artificial* –ventouse–)
2. Diffuse (pressure by pelvic bones)
- **Significance** ⇨ . Marks the presenting part
. If very large → obstructed or prolonged labor
. Fetus was alive during labor (medico-legal)

	Cephalhematoma	Caput succedaneum
Def.	Subperiosteal hematoma Never cross the sutures ± fracture of skull	Edema of scalp Not limited to one bone Normal skin & bone
Etiology	Traumatic or difficult labor	Spontaneous or ventouse
Comp.	No ttt disappears spont (2-8 wk); except .Infection → drainage + antibiotics .Haemolysis → ttt of jaundice .Brain compression → aspiration XX	Disappears [■] spont. in 1-2 days Just → reassurance

③. Asynclitism [■]

- **Synclitism** (25%):
⇨ Both parietal bones enter the pelvis in the same time
⇨ Sagittal suture is midway between SP & sacrum
⇨ Engagement is by the biparietal diameter (9.5cm)
- **Asynclitism** (75%):
⇨ Lateral tilt of neck (head descends with 1 parietal bone < the other)
⇨ Sagittal suture is not in the midline
⇨ Engagement is by the supraparietal-subparietal diameter (9cm)

BONY PELVIS-BRIM





The female pelvis



...False pelvis → above pelvic brim (not important)

...True pelvis → below pelvic brim

1) Pelvic inlet

* The plane of pelvic Inlet passes by

Symphysis pubis → Pubic crest → Pubic tubercle → Upper border of pubic ramus → Ilio-pectineal eminence → Ilio-pectineal line → Sacroiliac joint → Ala of sacrum → Sacral promontory

* Diameters of Inlet



► Anteroposterior

- Anatomical (True) conjugate = 11 cm
From sacral promontory to *middle* of upper border of SP
- Obstetric conjugate = 10.5 cm
From sacral promontory to *most bulging point* on back of SP
- Diagonal conjugate = 12.5 cm
From sacral promontory to *lower border* of SP
- External conjugate = 20 cm
Bet. anterior aspect of upper border of SP & tip of L₅

► Transverse diameters

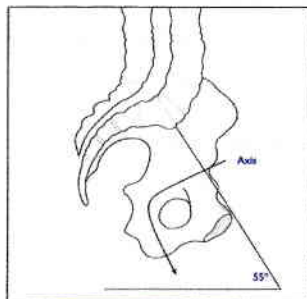
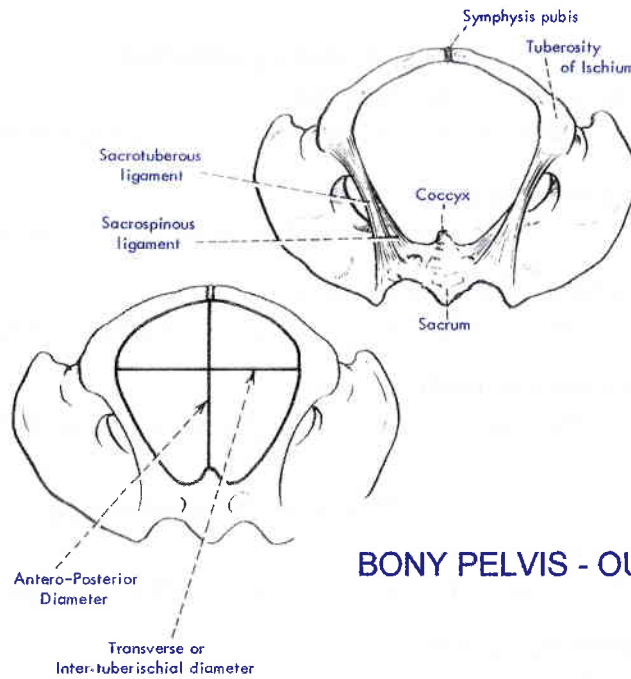
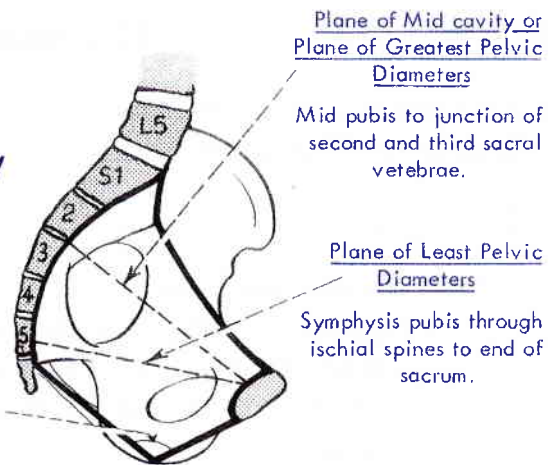
- Anatomical = 13 cm
Between widest points on pelvic brim (at iliopectineal line) – not important
- Obstetric = 12 cm
 - The transverse diameter which bisects the center of true conjugate
 - The actual diameter utilized by the fetal head during labor
In normal ♀ pelvis → these 2 diameters coincide, while in android pelvis → the anatomical diameter is behind the obstetric i.e. nearer to the promontory

► Oblique diameters

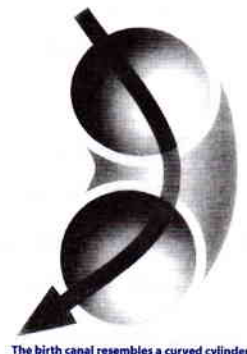
- Right oblique = 12.5 cm (> left → LOA is more common than ROA)
From right sacroiliac joint to left eminence
- Left oblique = 12 cm
From left sacroiliac joint to right eminence
- Sacrocytoid = 9.5 cm
 - From midpoint of promontory to iliopectineal eminence on same side
 - Diameter of engagement of biparietal diameter in OP position

Cavity

Note that pelvic outlet plane is in two parts angled to each other.



Inclination of the pelvic brim and the axis of the birth canal. The plane of the pelvic brim makes an angle of about 55° with the horizontal in the erect patient, and the plane of the outlet about 10° with the horizontal. The axis of the birth canal is angled, the alteration in direction occurring at the pelvic floor.



The birth canal resembles a curved cylinder.

2) Pelvic cavity

- * Between back of SP & front of sacrum
- * Plane of greatest dimensions (12.5 cm in diameter)
 - Imaginary plane from the middle of posterior surface of SP across center of acetabulum to the junction of 2nd & 3rd sacral pieces
- * Internal rotation occurs at this level... (the widest plane)

3) Pelvic Outlet (inferior pelvic strait)

- It is a segment bounded above by → plane of obstetric outlet & below by → plane of anatomical outlet
- Pelvic outlet has no ant wall (as roof & floor meet at subpubic angle)
- ☆ **Plane of anatomical outlet**
 - From lower border of SP → ischiopubic ramus → ischial tuberosity → sacrotuberous ligament → lower end of coccyx
 - Diameters ∩
 - **Anteropost** (11 cm) from lower border of SP to tip of coccyx
 - **Transverse** (11 cm) = Bituberous: between ischial tuberosities
- ☆ **Plane of obstetric outlet**
 - From lower border of SP to ischial spines to tip of sacrum
 - Diameters ∩
 - **Anteroposterior** (13 cm) = From lower border of SP to tip of sacrum (as coccyx moves backwards)
 - **Transverse** (10.5 cm) = Interspinous: between ischial spines (*Plane of least pelvic dimensions* [□])

► Thom's rule or dictum

- The plane of the anatomical outlet is formed by 2 triangles (ant & post) with intertuberous diameter as a common base
- The bituberous diameter divides the anteroposterior diameter into
 - 1- anterior part → anterior sagittal
 - 2- posterior part → posterior sagittal
- The sum of (bituberous + posterior sagittal diameter) should be > 15 cm to allow delivery of an average sized head.
If < 15 cm → contracted outlet

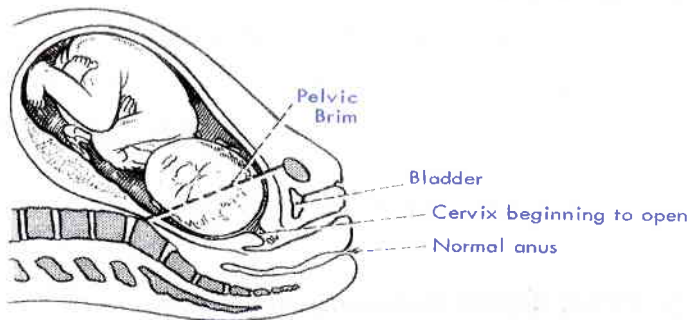
⇒ Pelvic axis

☆ **Anatomical...** Line passing through midpoint of antero-posterior diameters → C-shaped Curve of Carus

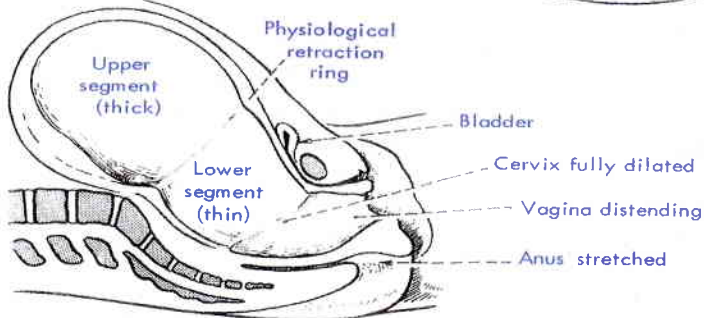
☆ **Obstetrical...** L-shaped & it is the pathway used by the fetal head

⇒ Angle of inclination = 55° (plane of pelvic inlet on the horizontal)

At BEGINNING of LABOUR



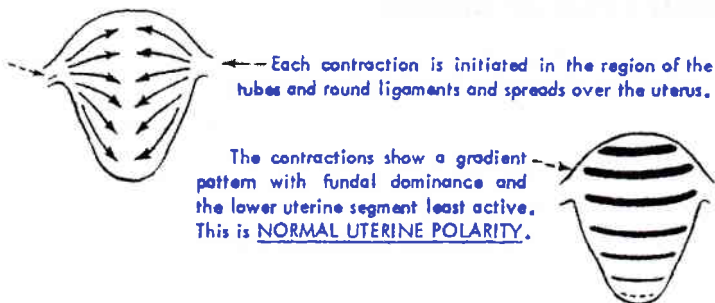
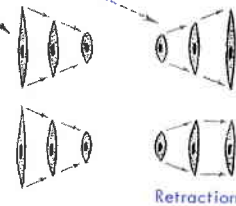
Birth Canal at beginning of SECOND STAGE



The fibres of the myometrium CONTRACT and RELAX like all muscle.

In LABOUR when the muscle fibres relax they do not return to their former length but become progressively shorter. This is RETRACTION.

The UTERINE CAPACITY is thus progressively REDUCED.



Types of contractions: during the last month of pregnancy, 2 types of contractions are identified:

- α -waves: irregular....low amplitude....high frequency
- β -waves: regular.....high amplitude...low frequency
 - ↳ $\uparrow\uparrow$ towards labor (Braxton Hicks) $\rightarrow$ ripening of cx

Contractions are assessed by

- Simple observation
- Manual palpation
- External or internal monitoring



Forces of labor



1] Uterine action.....divided into UUS & LUS:

ΦΦ

CPR-i.e.

- LUS is formed from the isthmus ± lower ½ inch of body ✓
- It starts formation at 12 weeks (0.5 → 10 cm)
- Junction bet UUS & LUS → physiologic *retraction* ring

	Upper segment	Lower segment
Length	Upper ¾ (20 – 30 cm)	Lower ¼ (10 cm)
Peritoneum	Adherent	Loose
Muscle	Thick (3 layers)	Thin (2 layers)
Decidua	Well developed	Poorly developed
Membranes	Adherent	Loose
Activity	Active	Passive

☆ Contraction & retraction

- ↳ Contraction = temporary shortening of ms fibers after which complete relaxation occurs → regaining of the original length
- ↳ Retraction = shortening of ms fibers after which incomplete relaxation occurs → permanent shortening of muscles

☆ **Progressive** → contractions start weak then gradually increase in frequency, duration & amplitude till 3 – 5 / 10 min each lasting 40 – 60 sec with intensity 40 – 60 mmHg[□]

☆ Coordinated

- ↳ Starts at the (right) utero-tubal junction (pace maker of uterus)
- ↳ All uterine muscle contract simultaneously, but:
- ↳ Intensity is more at the fundus (fundal dominance)

☆ **Rhythmic** → to allow blood supply to the fetus

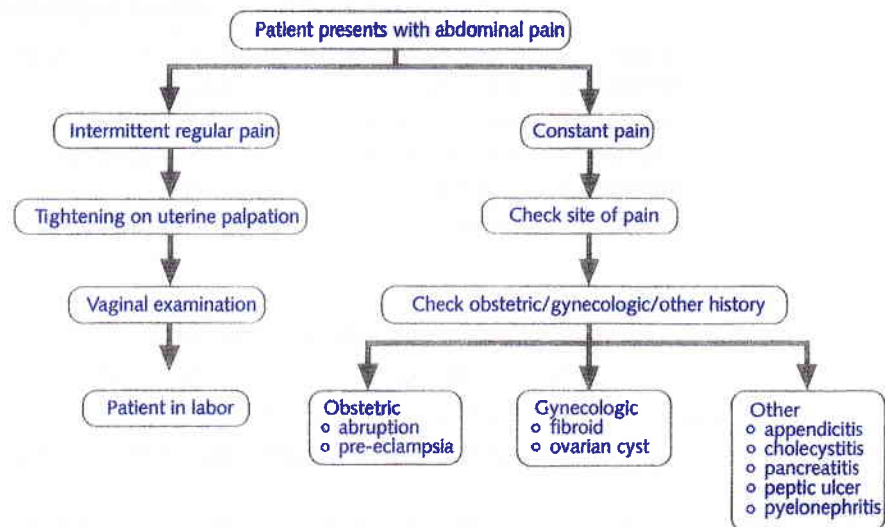
☆ **Involuntary** → independent of the extra-uterine nervous control

☆ Effective

- ↳ Dilatation of cervix (1st stage) + formation of bag of forewaters
- ↳ Descent of fetus (2nd stage)
- ↳ Delivery of placenta (3rd stage)
- ↳ Preventing postpartum haemorrhage
- ↳ Help complete involution of uterus

2] Auxiliary forces.....bearing down

- * **Voluntary** → abdominal, diaphragmatic, intercostal muscles
- * **Involuntary (reflex)** → d.t. pressure on pelvic floor (marks the start of 2nd stage)



The difference between a normal primigravid and multigravid labour

Primigravida	Multigravida
Unique psychological experience	
Inefficient uterine action is common, therefore labour is often longer	Uterine action is efficient and genital tract stretches more easily, therefore labour is usually shorter
The functional capacity of the pelvis is not known – cephalopelvic disproportion is a possibility	Cephalopelvic disproportion is rare. If it does occur, it is usually secondary to some serious problem
Serious injury to the child is relatively more common. The incidence of instrumental delivery is higher	Serious injury to the child is rare. Furthermore, the risk of birth injury is less when the baby is born by propulsion rather than traction
Uterus is virtually immune to rupture	There is a small risk of uterine rupture, particularly if there is a pre-existing caesarean section scar



(1) Mechanism of normal labor



⇒ Labor, Parturition:-

- The physiological process by which uterine contractions expels the fetus & placenta (TOP) after fetal viability (28 ✓ / 20 wks)
- **Delivery:-** is 'only' the actual birth of the fetus from the uterus
- **Parity:-** have delivered before..... **Gravidity:-** is pregnant now

⇒ Definition of (Normal) labor 9 ✱

Spontaneous delivery through the natural passages of a
MATURE?! / SINGLE / ALIVE fetus presenting by the VERTEX (OA) with
No interference (± episiotomy) / no comp. within reasonable time

☆ **NB** maturity is considered at → (completed) 37 weeks

⇒ Theories of onset of labor: Φ

- [1] ↑ PROSTAGLANDINS → stimulate contractions (most accepted ✓)
- [2] ↑ OXYTOCIN → pr. of head on cx → release from pit (FERGUSON reflex)
- [3] ↑ ESTROGEN and / or ↓ PROGESTERONE
- [4] PLACENTAL ISCHEMIA → release of uterotonins (PG, oxytocin)
- [5] UTERINE OVER DISTENSION → reflex contractions
- [6] FETAL HPA axis → C.STEROIDS (∴ PosT is > in anencephaly) – sheep only

Prostaglandin release:

False labor pains (irregular uterine contractions) start in the last few weeks. This leads to some gaping of the cervix → upward ascend of organisms → a sub-acute inflammatory process occurs in the amniotic membrane → rupture of lysosomes & release of PG:

- *Ripening of the cervix*

Release of PG, hyaluronidase, collagenase → splitting of the long cx fibers into small fibrils → ↑ of the osmotic pressure → imbibition of H₂O → softening of cx

. This could be also done artificially (PG vag tab.)

- *Induction of onset of labor* (the most recent theory ✓✓)

- *Augmentation of labor* (after ROM): either

. Spontaneous (2–3 cm)

. Artificial (AROM)

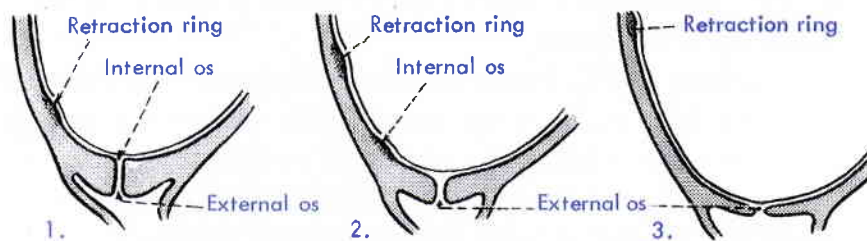
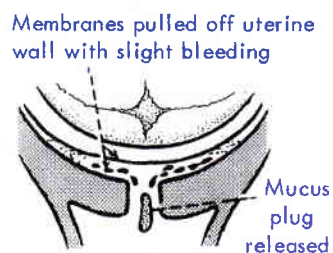
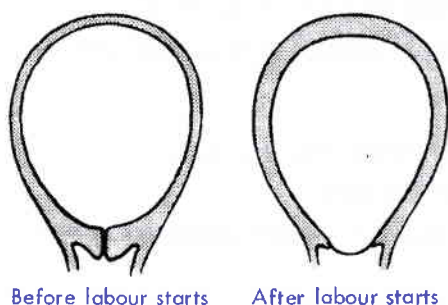
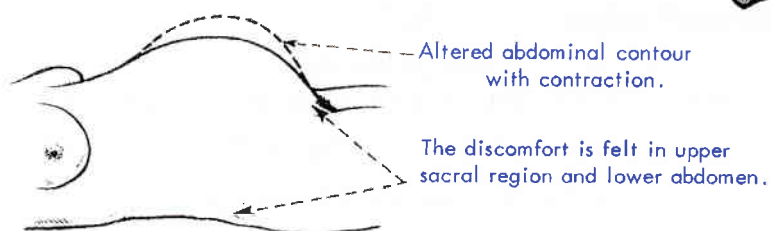
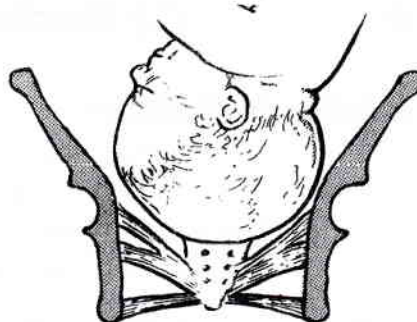
Progesterone release

Progesterone have a general relaxant effect → *quiescent* period

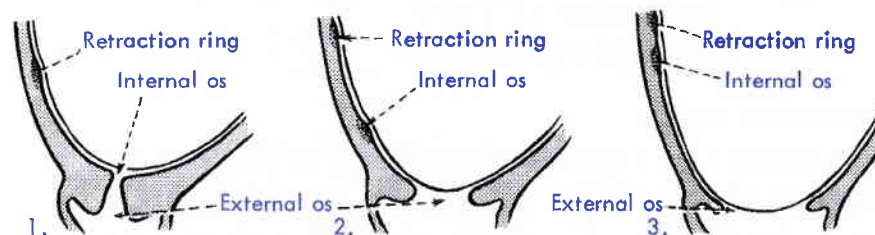
Therefore, it must ↓ before delivery

Also → estrogen must ↑ → to ↑ receptors of oxytocin & PG

ENGAGEMENT



The formation of the lower uterine segment causes 'thinning', 'taking up' or effacement of the cervix. Effacement is found most commonly in the Primigravida.



In the Parous patient dilatation and effacement of the cervix usually occur together.



1 Finger
2cm



2 Fingers
3.5cm
 $\frac{1}{3}$ DILATED



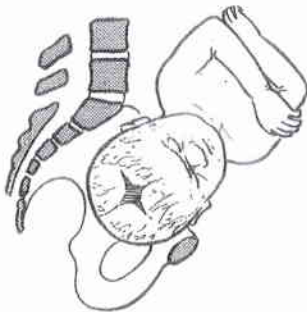
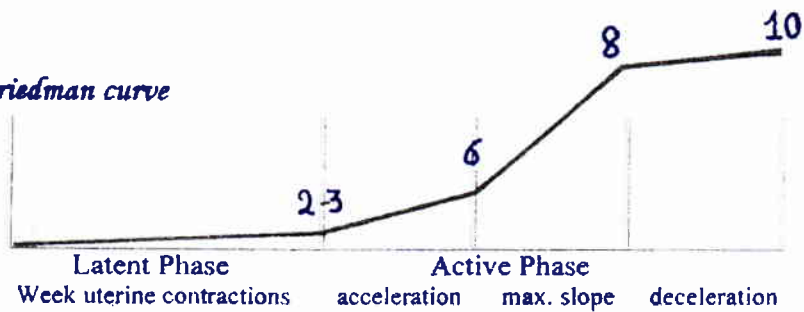
3 Fingers
5.5cm
 $\frac{1}{2}$ DILATED



4 Fingers
7.5cm
 $\frac{3}{4}$ DILATED

(These are Clinical Estimations)

► *Friedman curve*

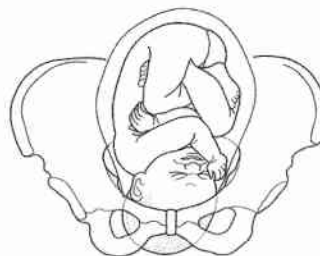


Fifths
above
pelvic
brim

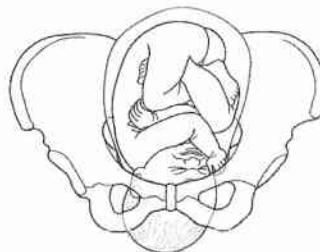
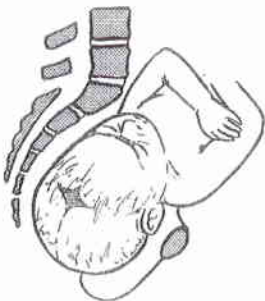
0
1
2
3
4
5



Head not palpable.
Sinciput felt: occiput not felt.
Sinciput felt: occiput just felt.
Sinciput easily felt: occiput felt.
Sinciput high: occiput easily felt.
Completely above brim.



Head 2/5 palpable (engaged).



Head 0/5 palpable (fully engaged).

Stages Of Labor



1st stage

- STAGE OF cervical dilatation
- STARTS BY true labor pains & ENDS at full cx dilatation (10 cm)
 - ↳ **Latent phase:** weak infrequent cont., with little dil. & effacement
 - ↳ **Active phase:** increased rate of cx dilatation (1cm /hr). Usually ROM occurs at 3-4 cm (although this may occur < or >)
- TIME
 - ↳ PG: 12 – 16 hrs (latent 8 hrs, active 4 – 8 hrs)
 - ↳ MG: 6 – 8 hrs (latent 4 hrs, active 2 – 4 hrs)

2nd stage

- STAGE OF delivery of the fetus (LOA is the commonest ✓)
- FROM full cervical dilatation TILL delivery of the fetus
- TIME → PG: 1-2 hrs, MG: ½-1 hr.
- MECHANISM :

① Descent

- This step occurs *continuously* during the labor process d.t.:-
 - . Uterine contraction & retraction
 - . Auxillary forces
- Most of the descent occurs near head delivery (deceleration phase)

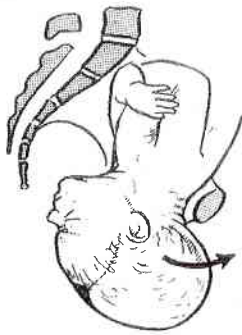
② Engagement

- Passage of the widest transverse diameter of the presenting part (biparietal = 9.5) below the plane of pelvic brim
- Known by :
 - . History of (*Lightening / Shelfing*)
 - . The head is not felt abdominally above SP or only 1/5 – 2/5 is felt
 - . P/V → The vertex is at / below the level of the ischial spines
 - ↳ large caput may give false impression of lower station

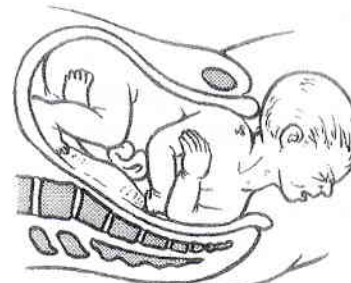
③ Increased flexion

- To bring 1st the occiput to the pelvic floor
- This could be explained by two theories:
 1. The head meets the resistance of the pelvic floor (levator ani) → ↑ flexion due to the 2 armed lever action

The head acts as a lever with a fulcrum at the atlanto-occipital joint. The short arm is from this joint to the occiput, the long arm is to the sinciput. When head meets resistance during descent, the force applied to the long arm is > from that on short arm → ascent of sinciput & descent of occiput
 2. Accommodation theory: to allow the shortest long. diameter of head (sub-occipito-bregmatic; 9.5 cm) to pass through pelvis.



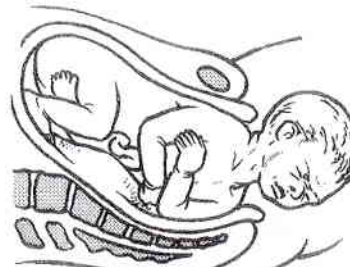
Delivery of Head



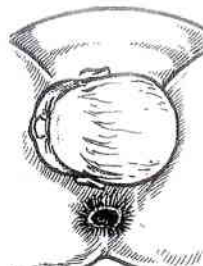
Delivery of Head



Restitution



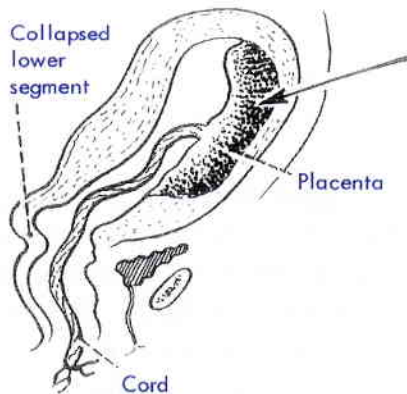
Restitution



External Rotation



External Rotation



The placenta is usually attached to fundus and anteriorly. The lower segment has been stretched and has no tone so it is collapsed. The upper segment is firm and the fundus is just below the umbilicus.



Matthews
Duncan



Schultze

④ Internal rotation

- To allow the longitudinal diameter of the head to pass in the longest diameter of the pelvic outlet as the pelvic inlet is transverse oval while outlet is longitudinal oval
- This could be explained by two theories:
 1. The **occiput** meets pelvic floor 1st → rotates forwards $\frac{1}{8}$ of circle
 2. Accommodation theory: the slope & shape of pelvic floor (down, medial, forward) → acts by a screw (rifling) action on the fetus

- ⑤ Extension The head descends till the suboccipital region hinges below SP followed by extension with birth of the head (crowning is by the: sub-occipito-frontal; 10cm)

- ⑥ Restitution The head will rotate $\frac{1}{8}$ of a circle (in an OPPOSITE direction) to UNTWIST the neck

⑦ External rotation

The head will rotate a FURTHER $\frac{1}{8}$ of a circle so that the face looks to one side. This is because the shoulders enter the pelvis in the opposite oblique diameter with anterior internal rotation $\frac{1}{8}$ of a circle which is accompanied by external rotation of the head

⑧ Delivery of the shoulders

The anterior shoulder hinges below the SP followed by delivery of the POST shoulder 1st by lateral flexion then the ANT shoulder follows

3rd stage

- Definition: expulsion of the placenta (after birth) due to contraction & retraction → placental site shrinks from 20 → 7cm & as the placenta can't shrink (incompressible) → it separates.
- Time → PG: 10-30 min, MG: 5-15 min
- Mechanism :
 - ▶ **Schultze 80%**

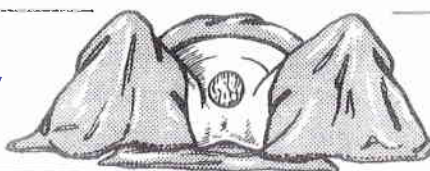
The central part separates 1st & the placenta is delivered as an inverted umbrella (with a retroplacental hematoma) → less liable to *hge* or *retained parts* (memb. peel off from periphery)
 - ▶ **Duncan 20%**

Separation of lower margin of the placenta → placenta is delivered by its sideways → more liable to retained parts & hge.
- Signs of placental separation (1,2) & descent (3,4): [■]
 1. Gush of blood vaginally 1st sign
 2. Apparent elongation of cord
 3. ↑ fundal level (as placenta distends LUS & lifts UUS) + firm [■] fundus ✓ [■]
 4. Suprapubic bulge (distended LUS by placenta)

MANAGEMENT—DELIVERY ROOM

FOR MOTHER

Sterile drapes for legs and thighs.
Sterile sheet and pad to go below
buttocks and on bed.
Sterile towel to cover abdomen.



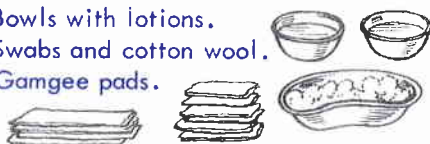
FOR EPISIOTOMY and REPAIR of PERINEAL WOUNDS

Local anaesthetic
syringe and needles.
Scissors - for cutting
perineum (episiotomy).
Sutures and needles
for repair.



FOR SWABBING and WIPING CLEAN

Bowls with lotions.
Swabs and cotton wool.
Gamgee pads.



COTTON WOOL FOR WIPING BABY'S EYES

FOR CARE of CORD

Pressure forceps to
clamp cord,
or cord clamp or
cord ligatures.
Scissors to cut cord.



FOR REPLACING SOILED ARTICLES

Spare sterile towels
and sheets.



FOR BABY CARE (see Care of New-born and Asphyxia.)

Sterile towel - for reception.

Mucus suction catheter.

Oxygen.

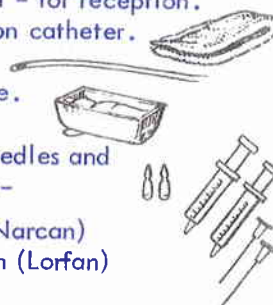
Laryngoscope.

Warm cot.

Syringes, needles and
ampoules of:-

Naloxone (Narcan)

Levallorphan (Lorfan)



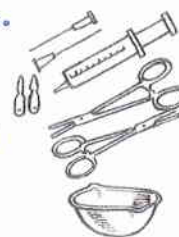
FOR CONTROLLING BLEEDING

Oxytocic drugs.

Syringe and needles.

Pressure forceps for
bleeding points
in perineum.

Bowl to collect and
measure third stage
blood loss and to
receive placenta.



FOR ATTENDANTS CON- DUCTING DELIVERY.

Sterile masks, caps,
gowns and gloves.



History

Pinard's stethoscope was invented in France in 1816 by René-Théophile-Hyacinthe Laennec (1781-1826). It consisted of a wooden tube and was monaural. His device was similar to the common ear trumpet, a historical form of hearing aid; indeed, his invention was almost indistinguishable in structure and function from the trumpet, which was commonly called a 'microphone'.

Vaginal examinations

Finding on VE	Details
Presence or absence of meconium	Meconium staining might suggest fetal distress
Dilatation of the cervix	In centimetres from 0 to 10 cm
Station of the presenting part	In centimetres above or below the ischial spines
Position of the head	With reference to the occiput if cephalic, or sacrum if breech. A note should be made of whether the head is flexed or deflexed
Presence of caput and/or moulding	If excessive, might suggest obstructed labour

❖ (2) Management (conduction) of labor ❖

1st stage

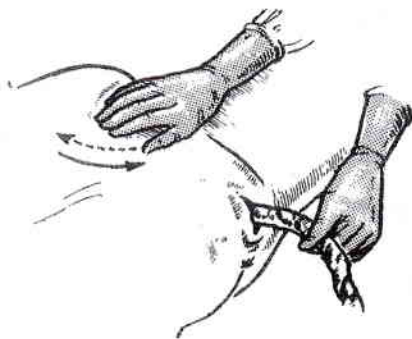
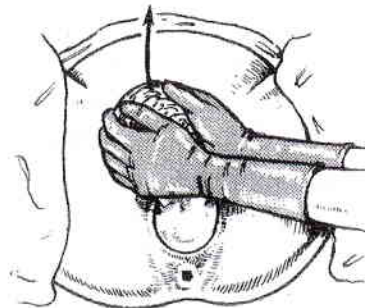
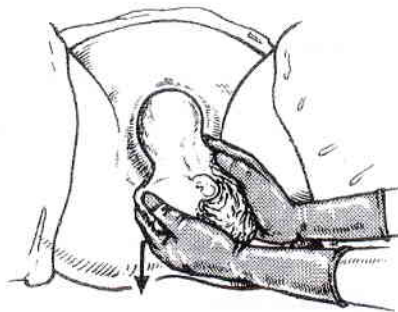
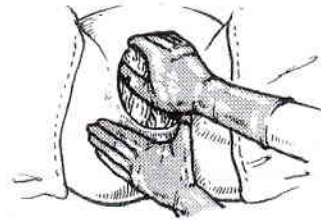
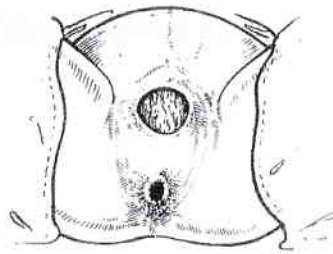
.....History, general, abdominal, vaginal examination.....

- 1) Allow mobility till ROM → helps reflex polarity & oxytocin release
rest is better in the *left lateral* position
- 2) Diet → light esp. fluids or IV glucose (to avoid Mendelson syndrome)
- 3) Evacuate bladder → avoid inertia, avoid liability to injury or obstruction
- 4) Evacuate rectum → avoid inertia, avoid soiling perineum by feces
Evacuation is encouraged naturally, not by enema
(they ↑ infection rate, & not proved to facilitate labor)
- 5) Analgesia
 - Pethidine 100 mg IM (avoided in the last 2 hours < delivery)
 - Epidural analgesia
- 6) Asepsis
 - *Attendants* → not infected , gowns, masks, sterilized
 - *Female* → shave vulva (scissors is better –less infection– than shaving)
use antiseptics → as betadine or savlon to swab the vulva
 - *Instruments* → sterile
 - *Avoid unnecessary PV*
- 7) Observation
 - *General* → BP, P, Temp.
 - *Abdominal* → uterine contractions, FHS, external monitor
 - *Vaginal* → . Vagina, cervix, membranes, pelvic capacity (*CPD*)
. Presentation, position, descent & engagement (*station*)
- 8) Investigations → Hct, RH, urine sample (if not done in the ANC)

2nd stage

known when

- Involuntary bearing down + increase pain
 - Cervix fully dilated
- 1) Position → lithotomy better in delivery room
 - 2) Analgesia
 - Inhalation analgesia (Entoxone) 50% O₂ + 50% NO₂
 - Local infiltration by lignocaine 1%
 - 3) Asepsis
 - 4) FHS is heard every **5** minutes



Modified Brandt andrew's

5] Delivery of the head

- *The patient is told to bear down during contractions & relax inbetween*
 - Then maintain flexion of the head till crowning by pressing with a pad on the perineum & hand on the occiput
 - Crowning: The fetal head is encircled by the vulval ring (i.e. the biparietal diameter has passed the vulval outlet & the suboccipital region is hinged behind SP → so the head will not recede backwards)
 - This is done to allow the least diameters to distend the vulva to decrease possibility of trauma
 - Then allow gradual controlled extension inbetween contractions (Ritgen maneuver) → allow the perineum to slide over the face without downward push from the mother
 - ✗ Fundal pressure ??? Pressing backwards on perineum ???
- *May perform episiotomy*
- *Swab the mouth & nose*

6] Delivery of the shoulders

- Wait for external rotation
- Head is held by 2 fingers above & below the neck
- Gentle traction downwards → deliver the POSTERIOR shoulder 1st
- Followed by ant shoulder → then trunk by lat flexion of spine

3rd stage

A] Conservative method ✗✗

- Put hand on fundus & wait for signs of placental separation.
- Then → encourage patient to strain → catch placenta & *roll between hands to peel away membranes* → examine the placenta
- Then give 5–10 units syntocinon IV or IM
 - ↳ methergine (0.5mg) is avoided in PET, cardiac patients

B] Active method

- To ↓ blood loss & ↓ incidence of retained placenta
- Give oxytocin IV with delivery of head or anterior shoulder or just after delivery of baby, Then :

* Modified Brandt Andrew's method ✓

- . The remaining stump of the cord is kept under tension by controlled traction (no direct cord traction),
- . While the uterus is massaged by the ulnar surface of hand in a fundal direction (when signs of placental separation appear)

* Crede's method ✗

- . Catch fundus in hand & push downwards.
- . Disadv → very painful, may lead to inversion & later on → prolapse

- Placenta & membranes are examined for missed parts
- Inspect & repair perineal & vaginal tears.
- Fundoperineal examination....how?
 - Done only if **blood** if seen ✓✓
 - Done only in **abnormal** labor course ✓
 - Routine by some (esp if general anesthesia was used) ✗

4th stage

- Some consider the hour after 3rd stage is critical & the mother should be under close observation for PPHge.
- Patient kept under observation for 8-24 hours

Care of newborn

- 1) Airway → cleared by gentle suction
- 2) Breathing → assist respiration if needed by rubbing back or gentle slapping of back or artificial respiration in special cases
- 3) Cord → Milk cord towards baby (except if Rh-ve mother) then clamp 2 or 3 fingers from umbilicus after exclusion of umbilical hernia or may use silk ligatures
- 4) Drugs → prophylaxis against ophthalmia neonatorum by penicillin eye drops
- 5) Examine for malformations e.g. imperforate anus
- 6) Weigh & mark the baby

APGAR SCORE (very imp) recorded at 1 & 5 minutes

		0	1	2
Appearance	color	Blue, pale	Body→ pink, extremities→ blue	Pink
Pulse	HR	Absent	< 100	> 100
Grimace	response to stimuli	Absent	Grimace	Crying / cough
Activity	muscle tone	Flaccid	some flexion of extremities	Active movement
Respiration	respiratory effort	Absent	irregular, gasps	Regular/ strong cry

7-10 (normal) → no need for further ttt

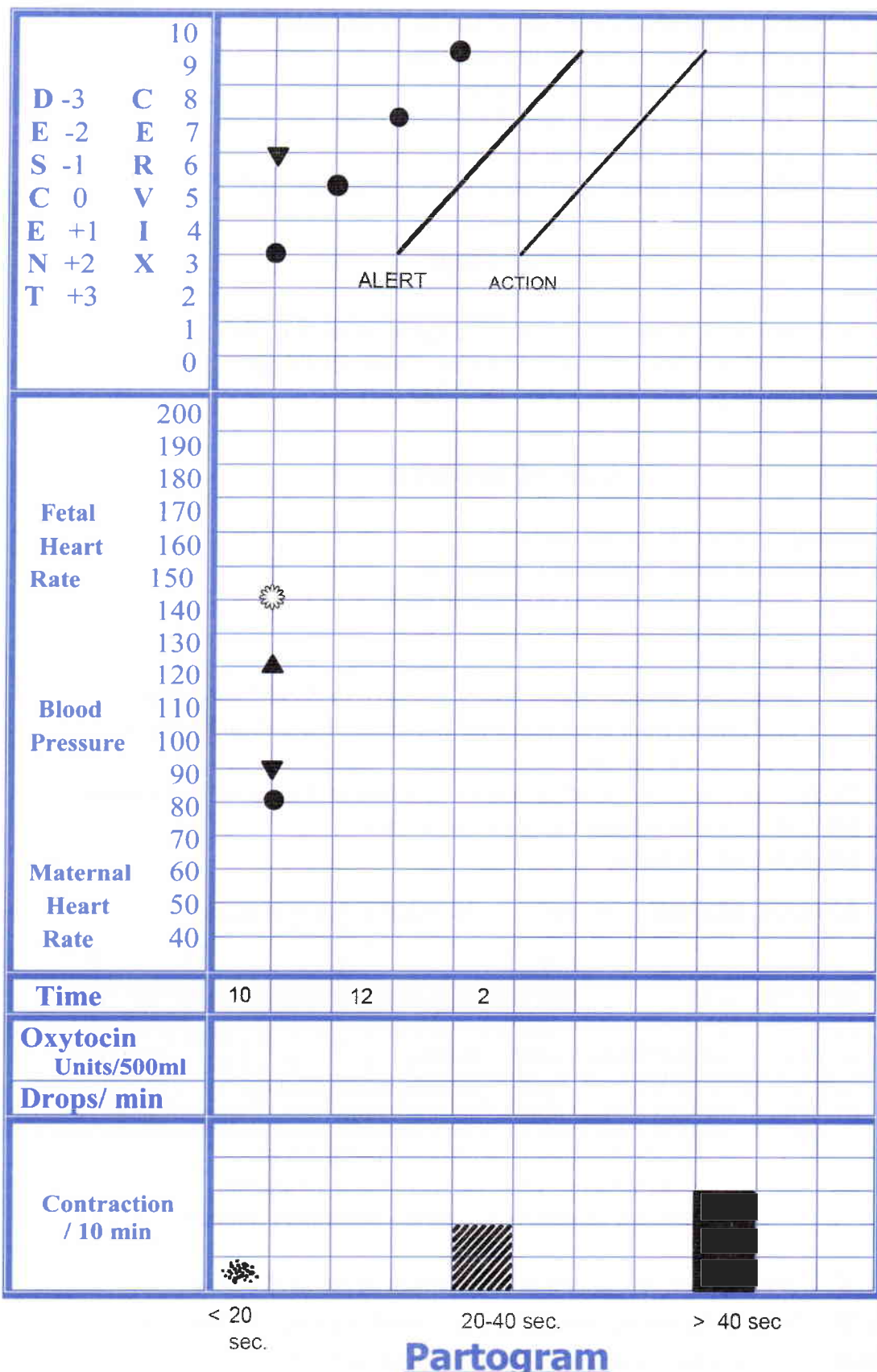
4-6 (moderate depression) → assist ventilation

< 4 (severe depression) → cardio-respiratory Support

N.B....What are the causes of non-engagement of the head ? Φ Φ

N.B....What is the normal mechanism to control placental site bleeding ?

N.B....What is the importance of the ischial spine ?.....7 □ □



❖ (3) Active management "Partogram" ❖

Aim

- ▶ Concept → labor should not last > 12 hours
- ▶ Aim → early diagnosis & correction of any abnormalities
- ▶ Adv. → less % of exhaustion of (M, F, staff)

Technique

- ▶ Proper admission in the "active" phase of 1st stage
- ▶ Immediate "AROM" is performed for all patients
 - This leads to
 - Liberation of prostaglandins
 - Proper application of the head to the cervix
 - Shows the character of amniotic fluid
 - One hour later, if uterine contractions are still inadequate
 - ↳ augmentation of labor by oxytocin drip
- ▶ Observation "Partogram" = diagrammatic presentation of labor events
 - Maternal
 - a) Vital data (B.Pr., pulse, temp) / hour
 - b) Uterine contractions → frequency, duration / 10min
 - c) Cervical dilatation → PV / 2 hours
 - Fetal
 - a) FHS → /15-30m (1st stage)...../ 5 m (2nd stage)....continuous in HRP
 - b) Descent of presenting part → station (relation of vertex to ischial spine)
 - c) Amniotic fluid examination → meconium, purulent, bloody, yellow

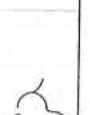
Normal progress

- Normal cervical dilatation → sigma curve
- Normal fetal descent → hyperbolic curve

Philpott Alert & Action lines

- Alert line → if there is a 2 hour delay i.e. be alert → reassessment of the condition (general, local) → to ensure that proper management has been performed
- Action line → if there is a 4 hour delay → CS is performed (too much delay for correction)

- ▶ Second stage
 - PG → 2 hours MG → 1 hour
 - Any delay → reassess:
 - If engaged → ventouse or forceps
 - If not engaged → CS
- ▶ Third stage → Brandet Andrew's method

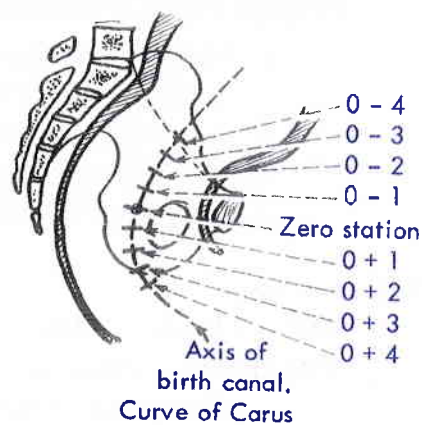
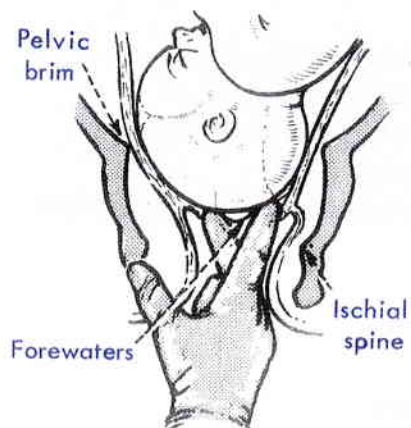
Completely above	Sinciput +++ occiput ++	Sinciput ++ occiput +	Sinciput + occiput just felt	Sinciput + occiput not felt	None of head palpable
5/5	4/5	3/5	2/5	1/5	0/5
					
level of pelvic brim					
'Floating' above the brim	'Fixing'	Not engaged	Just engaged	Engaged	Deeply engaged

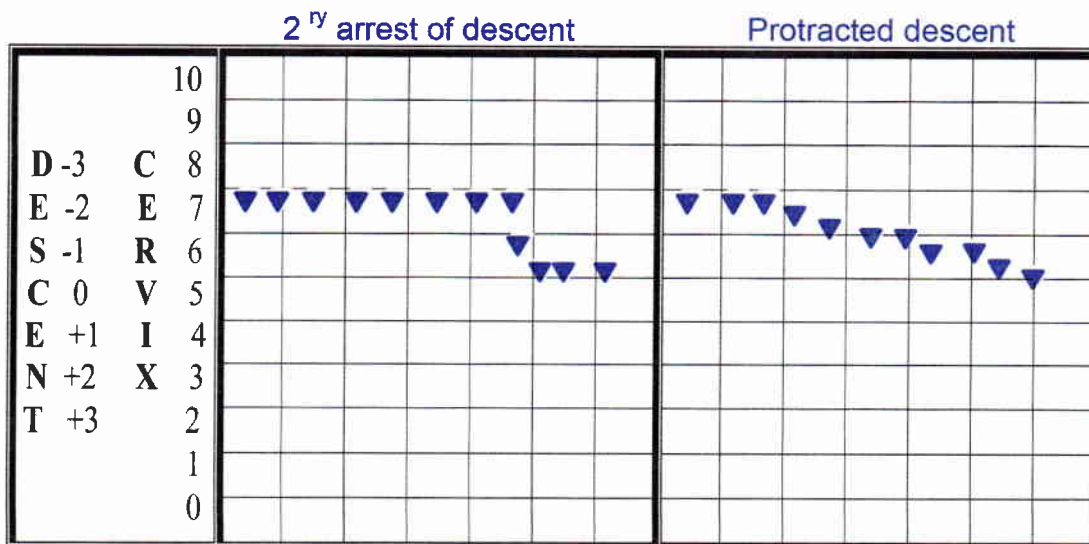
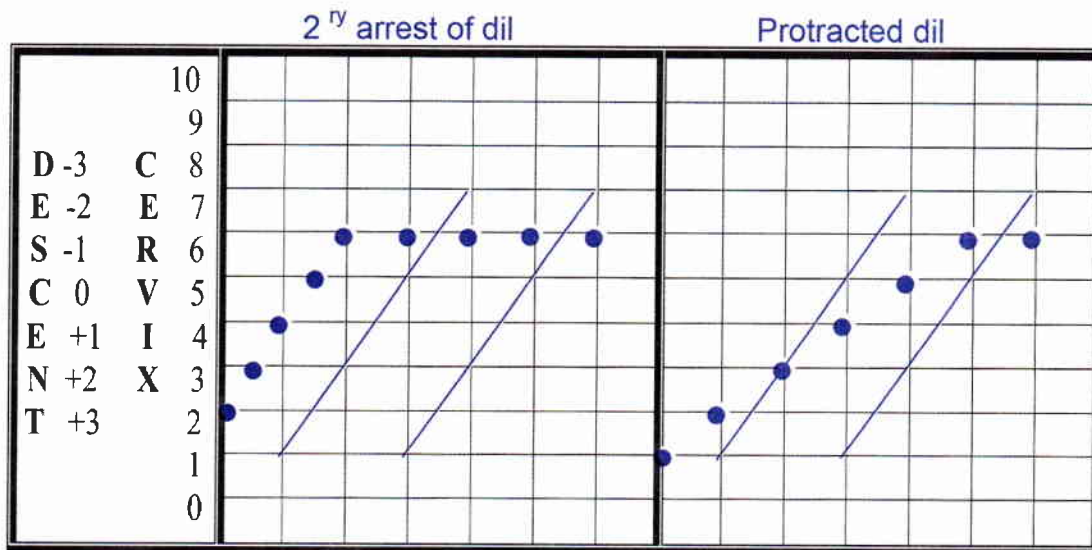
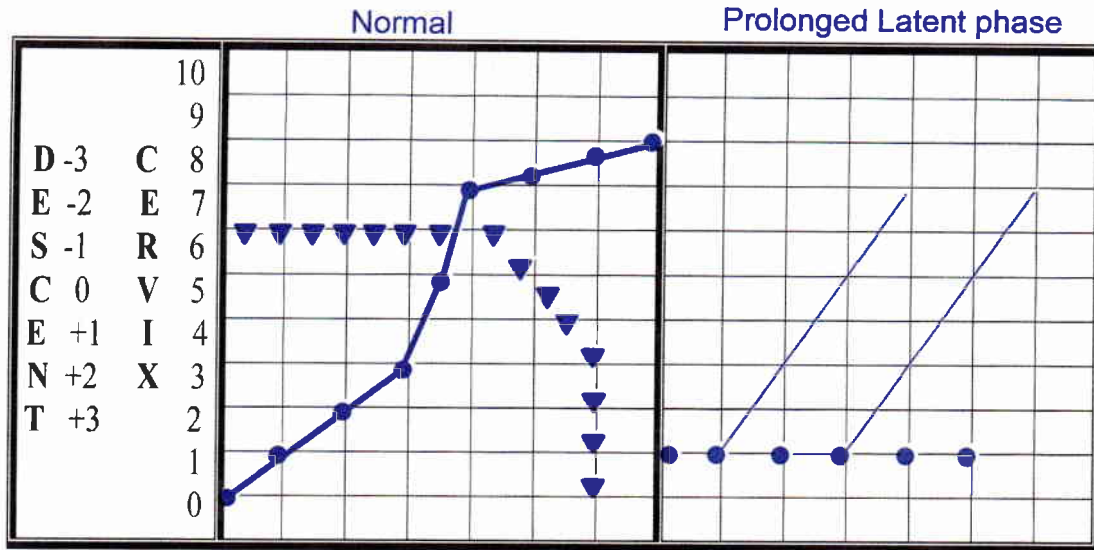
Abnormal labor patterns

- 1] Prolonged latent phase
- 2] Protraction disorders (cervix & descent)
- 3] Arrest disorders (cervix & descent)

Etiology

- 1] Early admission
- 2] Full bladder / rectum
- 3] Excessive analgesia / fear
- 4] Dehydration
- 5] CPD / Mal-position / Abnormal uterine action





Chapter 2

Abnormal Labor

Occipito - Posterior

Face Presentation

Brow Presentation

Breech

Transverse Lie

Contracted pelvis

Abnormal uterine action

Postulated causes of O.P.



Pendulous Abdomen - This is found in multiparae.



Anthropoid pelvic brim - This favours direct O.P. or direct O.A.



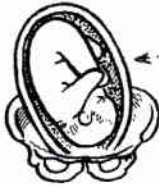
Android pelvic brim - The transverse diameter of the brim being near the sacrum encourages the biparietal diameter to accommodate posteriorly.



A flat sacrum with a poorly flexed head leads to further deflexion and O.P.

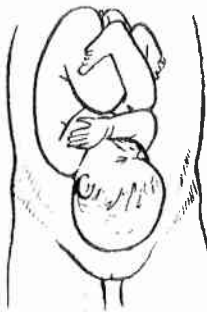


The placenta on the anterior uterine wall tends to encourage the fetus to flex round it.



R.O.L. position of the head and the normal right obliquity and dextro-rotation of the uterus favours deflexion of the head and R.O.P. descent. There is some assistance from the pelvic colon in the left posterior pelvic quadrant.

Chance also is an apparent cause.



The fetal head is postero-lateral in early labour in android pelvis and with descent of head.

The limbs are to the front and give hollowing above the head.



① Occipito-Posterior Position ▲

Definition

It is a VERTEX presentation in which the OCCIPUT is directed POSTERIORLY

*Either: **ROP** → 18% (3rd position) > **LOP** → 2% (4th position)*

*Because: **Rt** oblique diam. (12.5cm) is longer than **Lt** oblique due to*

- More use of the right LL
- The sigmoid colon encroaches on the left oblique diameter
- Dextroposition & dextrorotation of the uterus

Etiology

* General causes (↔) of malpresentations +

- Special pelvic configuration & types as
 - Android pelvis ✕ ✓✓ (narrow forepelvis)
 - Anthropoid pelvis (narrow transverse diameters)
- Maternal Kyphosis
- Anteriorly inserted placenta

* Idiopathic → 10-20% of cases

Clinical picture

► In pregnancy

- * **Inspection** - Flat subumbilical region (*no back anterior*)
 - Groove may be seen subumbilically (*groove of the neck*)
 - Fetal movements may be seen (*on both sides of midline*)

* **Palpation**

- Fundal level ➡ corresponds to the period of amenorrhea
in last wks may be higher (failure of engagement)
- Fundal grip ➡ breech
- Umbilical grip ➡ - Limbs:- felt easy on both sides of midline
- Back:- difficult to feel or not felt
- Pelvic grips ➡
 - Not engaged head
 - Bitemporal diameter felt (small) & head tends to recede away

* **Auscultation**

- FHS heard near ASIS (flanks)
- In DOP with marked deflexion → FHS heard in midline subumbilically

* **U/S** → confirmation of *position* & exclusion of CFMF

⇒ Mechanism depends on:- ⇒ ⇒

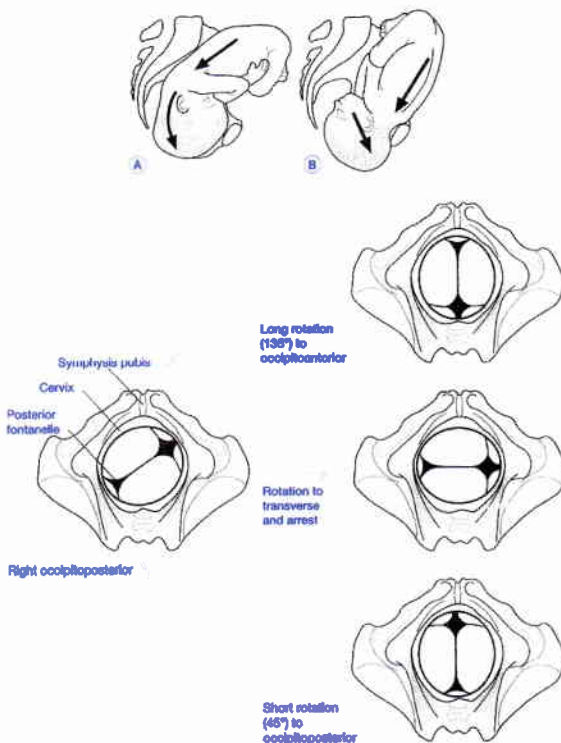
Passenger	Passage	Power
1- Degree of deflexion of head ✓✓ due to: - Engagement of biparietal diameter (9.5 cm) in sacrocytoid (9.5 cm) - Apposition of maternal & fetal spines - If PROM → straightening of fetal spine	1- Pelvic capacity - Adequate → easy - Contracted → difficult	1- Uterine contraction - Efficient → rotation - Weak → prolonged labor
2- Size of the fetus - Average or small → easy delivery - Large → difficult or obstructed	2- Soft tissue - Too lax / too rigid → interfere with rotation - Soft tissue obst.	2- Auxillary power - Pendulous abdomen → prolonged lab.

Two types of occipito-posterior (O.P.) are described.

A Flexed O.P. with suboccipito-frontal and biparietal diameter engaging 10 cm x 9.5 cm.



B Deflexed O.P. with occipito-frontal and biparietal diameters engaging 11.5 cm x 9.5 cm.



Occipitoposterior position (A) Compared to an occipitoanterior position (B).

► **In labor:**

* *Early*d.t. imperfect application of head on cx ⇔

- Slow dilatation of cervix
- Large bag of forewaters (protrude as a finger like)
- Liable to PROM → cord prolapse, ascending infection

* *Late*

- The anterior fontanelle is felt ✓ easier than the posterior
- If prolonged / obstructed → large caput → mask fontanelles:-
 ↳ position is known by ears (*helix* → post / *tragus* → ant)

Mechanism of labor

.....Depends on degree of **DEFLEXION** of head[■] ✓.....

► **Normal (90%)[■]** deflexion is very slight (all factors favorable)

- descent
- increased flexion
- occiput reaches pelvic floor first
- rotates forward $\frac{3}{8}$ of a circle (LONG ANTERIOR ROTATION)
- delivered as occipito-anterior

► **Abnormal (10%)**

► **Deflexion is mild (1%)**

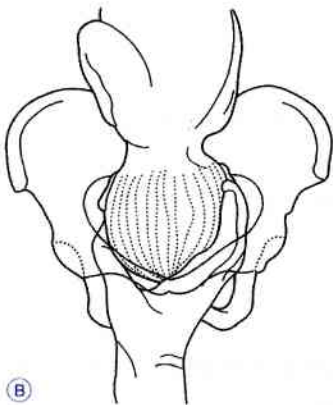
- descent
- occiput reaches pelvic floor
- rotates $\frac{1}{8}$ of a circle anteriorly
- The head is arrested midway in rotation in transverse diameter
 ↳ **Deep Transverse Arrest**.....common in flat pelvis

► **Deflexion is moderate (3%)**

- descent
- both occiput & sinciput reach the pelvic floor at same time
- no rotation & the head is arrested as such
 ↳ **Persistent OP**.....common in android pelvis

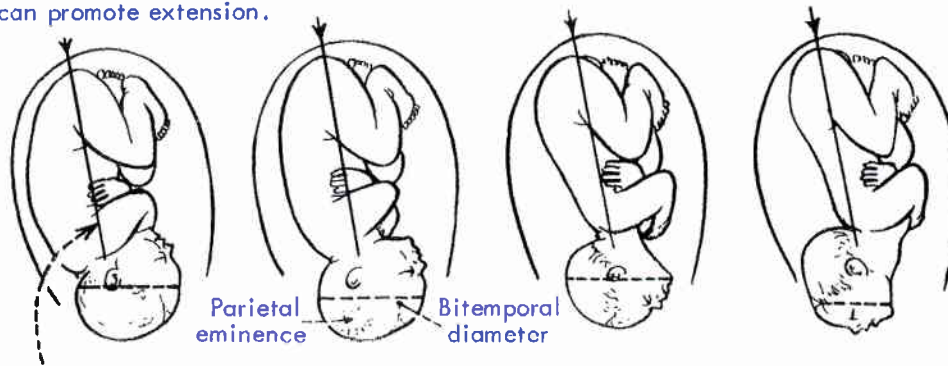
► **Deflexion is marked or severe (6%)**

- Descent
- *Sinciput* reaches pelvic floor first & rotates forward $\frac{1}{8}$ of a circle
- So occiput rotates backwards $\frac{1}{8}$ of a circle
 ↳ **Direct OP**.....common in anthropoid pelvis
 Here the face looks anteriorly → **Face to Pubis** delivery

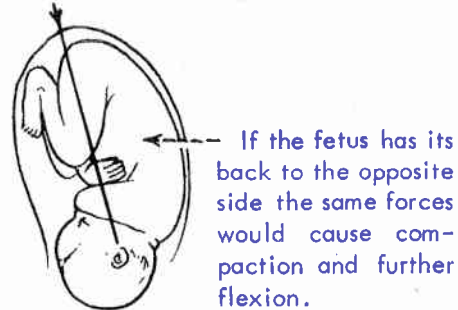


Manual rotation

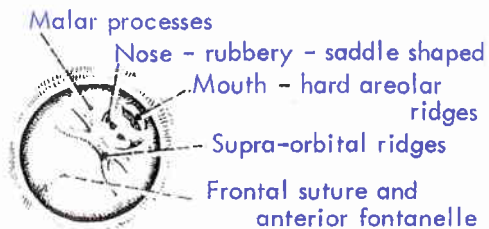
Incomplete flexion with occipito-posterior vertex and marked uterine obliquity can promote extension.



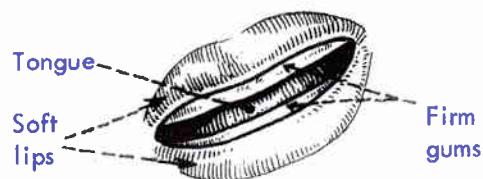
The action of the uterine forces, which normally tends to cause compaction, is in fact promoting extension of the head at the atlanto-occipital joint because the back of the fetus is in the same direction as the uterine obliquity.



VAGINAL EXAMINATION

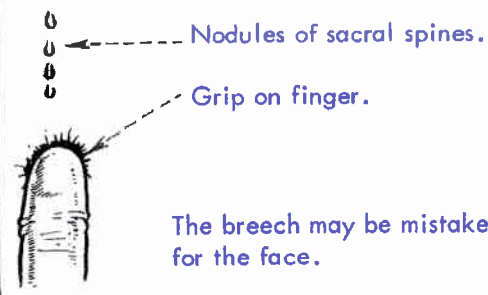


MOUTH



The mouth may be mistaken for the anus because of oedema masking laxity of the orifice.

ANUS



The breech may be mistaken for the face.

② Face presentation

Definition $\rightarrow 1/300^\circ$

- It is a cephalic presentation in which head is completely *extended*
- The denominator is the *chin (mentum)* which has 8 positions
- MA is *more common* than MP (as 2^{ry} face is more common)

Etiology +

- **Primary face**during pregnancy (mostly FETAL).....
 - CFMF → anencephaly, dolicocephaly
 - Neck swellings → cystic hygroma, congenital goitre
 - Loops of cord around neck
- **Secondary face**✓✓[□]develops during labor.....
 - It starts as OP → deflexion occurs
 - & converts to completely extended face

Diagnosis

➡ In pregnancy

* Inspection

- MA → fetal movements seen on both sides
- MP → sub-umbilical groove (depression between head & back)

* Palpation

- Fundal level → corresponds to period of amenorrhea
- Fundal grip → breech
- Umbilical grip . MA → back is not felt with fetal limbs on both sides
 . MP → subumbilical groove is felt
- Pelvic grip - Head is not engaged
 - Occiput is higher than sinciput

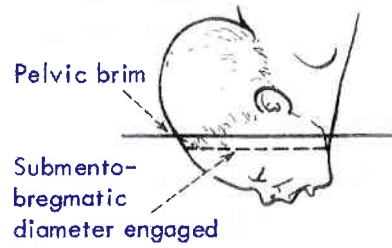
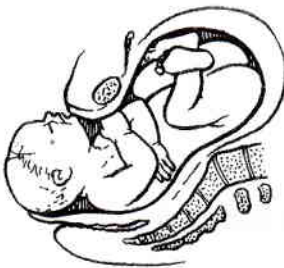
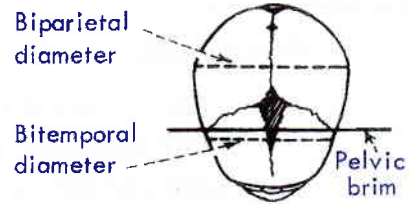
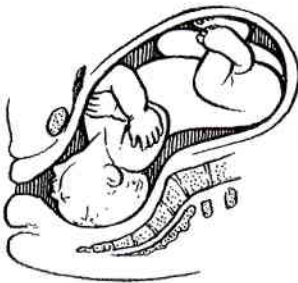
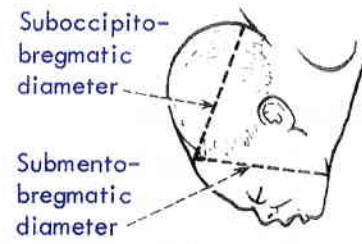
* **Auscultation** → MA (easily heard below umbilicus), MP (at flanks)

**US* → confirms the diagnosis + etiology

➡ **In labor**

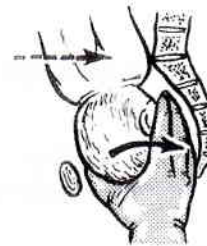
- Early $\rightarrow$ $\rightarrow$
- Late $\rightarrow$ face might be mistaken with

	Cavity	Bones	Diagnostic ccc
Face	Mouth	Chin + 2 maxilla	Alveolar margin + nose + suckling
Breech	Anus	Coccyx + 2 ischial tuberosities	Meconium + abd. Examination
Shoulder	Axilla	Clavicle + acromion + humerus	Feel the ribs
Brow		Frontal bone, no chin, no posterior fontanelle	



V. difficult

Manual rotation of mento-posterior



DMP



Sterno - bregmatic (18cm)

Management

☆ **Exclusion of CFMF** during pregnancy → early TOP

☆ First stage

- Guard against...inertia.....PROM.....sepsis.....
- Partogram.....analgesia.....AROM.....oxytocin...
- Exclude obstetric causes for CS (CPD, fetal distress)

☆ Second stage

- The head is given a chance to rotate forwards
- FURTHER MANAGEMENT DEPENDS ON HEAD ROTATION

Mento-anterior (80%)

1. **DESCENT** → **ENGAGEMENT** by submento-bregmatic (9.5 cm)
2. **INCREASED EXTENSION** → the chin meets pelvic floor 1st
3. **INTERNAL ROTATION** → 1/8 anteriorly → DMA
4. **FLEXION** → delivery of head (submental region hinges behind SP)
 ↳ distension of perineum by submento-vertical (11.5 cm)
5. **RESTITUTION** → **EXTERNAL ROTATION** → **SHOULDER DELIVERY**

Mento-posterior (20%)

1- Do CS ✓✓ after exclusion of CFMF or

2- WAIT FOR

* **LONG ANTERIOR ROTATION** 3/8 of a cycle in 40% of cases

 ↳ DMA → spontaneous delivery or use forceps if delayed

* **FAILED LONG ANTERIOR ROTATION**

 ↳ DTA (rotates anteriorly 1/8 only)

 ↳ PMP (military position)

For } If engaged → rotation (manual or forceps)

Both } If not-engaged → CS

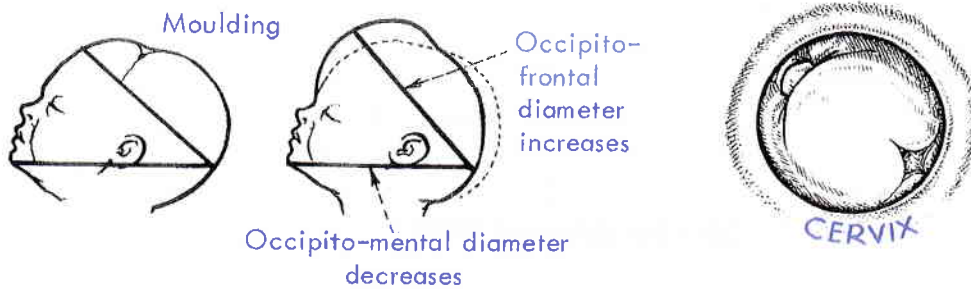
 ↳ DMP → CS:- it has no mechanism engagement is by the sterno (thoraco)–bregmatic diameter [18 cm]

Complications

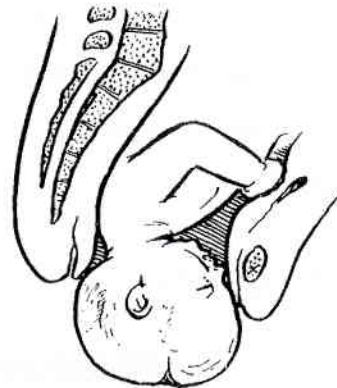
➤ Maternal → ...

➤ Fetal → CFMF + tumefaction of face & edema of glottis

Rarely



The brow slowly descends to pelvic floor and turns forward under the symphysis.



Flexion then follows and the brow, vault of the skull and occiput are born.



The head drops back over the perineum and the face and chin are born.

The mechanism thereafter is the same as O.P.

White Knight Love

Fully flexed
fetus



A.

Complete
or
Full breech

Not fully flexed fetus
with legs extended



B.

Frank breech

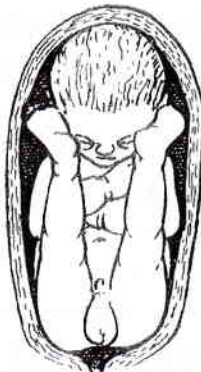
One or both thighs
extended



C.

Footling
or
Incomplete breech

Br. with
extended legs



Frank breech



Half
breech

④ Breech presentation 🚢



Definition

- It is a *longitudinal* lie
- Presenting by the lower fetal pole (*podalic*)
- Denominator is the *sacrum*

	Back	Position
1 st	Anterior & to the left	LSA
2 nd	Anterior & to the right	RSA
3 rd	Posterior & to the right	RSP
4 th	Posterior & to the left	LSP

Incidence

3.5 % [□] (in preterm → 35 %)

Therefore, the most common cause is **prematurity** [□]

Types

	(1) Complete breech (10%)	(2) Incomplete breech		
		Frank breech (70%) ✓	Knee	Footling
Hips	Flexed [□]	Flexed	Extended	Extended
Knees	Flexed [□]	Extended	Flexed	Extended
Part felt	Buttocks & feet	Buttocks	knees	Feet

* Frank breech is more common in.....PG

* Knee & footling more common inPreterm

Etiology

► The fetus assumes a cephalic presentation due to

1- Accommodation

→ the *smaller head* to the lower part of the uterus

→ the *larger fundus* is occupied by the large breech

2- Continuous fetal movement against uterine wall

3- Amount of amniotic fluid

....After 34 weeks → the fetus enlarges in relation to the amount of liquor with stabilization of fetal lie & presentation.

► Therefore the causes are

Interference with accommodation		Interference with movement	A. F.
↑ size of head	↓ capacity of fundus		
• Preterm ✓	- Septum → ®, bicornuate	• IUFD	Poly or Oligo.
• Hydrocephalus	- Fundal fibroid	• Multiple pregnancy	
• IUGR	- Pelvic tumor	• Breech with ext. legs (frank)	
	- Placenta previa	• Cord: short, around neck	

Descent continues until breech reaches pelvic floor. The anterior buttock rotates forward under the pubis (internal rotation).



Lateral flexion of the fetal body round the pubis allows the anterior buttock to slip forward under the pubis and the posterior buttock to slip over the perineum. The breech is delivered followed by the legs. A movement of restitution of the hips takes place.



The shoulders now engage in the same pelvic diameter as the hips - the left oblique. (The bisacromial diameter of the shoulders is 11cm.)



As descent continues internal rotation of the shoulders occurs in the pelvic cavity bringing one shoulder beneath the pubis and the other into the hollow of the sacrum. The anterior shoulder and arm are born first.



As the shoulders are being born the head enters the pelvic brim either in the transverse or left oblique of the brim. The engaging diameters of the head are the biparietal and the suboccipito-bregmatic or suboccipito-frontal.



The head descends into the pelvic cavity and rotates to bring the occiput under the pubis.



The occiput is arrested at the pubis and the head is born by flexion. The chin, face and brow are born first, and then the occiput.



Diagnosis

► In pregnancy

			Complete breech	Frank breech
Symptoms			Hard lump in one hypochondrium → dyspepsia	
Signs	1. Inspection		Fetal movements can be seen on both sides	
	2. Palpation	F. level	. Corresponds	. < period of amenorrhea
		F. grip	. Easily felt & ballotable	. Less felt + ballotement
		Umb. gr	. Back is felt	. More difficult to feel
		Pelvic gr	. Large + not engaged	. Smaller + engaged
	3. FHS		Above umbilicus	At or below umbilicus
Investigations (U/S) ✓✓			Know type / degree of head flexion / exclude CFMF	

► In labor

* Early

- Slow dilatation of cx → large bag of forewaters
- PROM → cord prolapse (better prognosis than cephalic[□])
- Frank breech usually early engaged → MECONIUM stained liquor

* Late → Denominator bone is felt (sacrum) → exact position
[Anus + 3 bones + head abdominally ± meconium]

Mechanism of labor

1] Delivery of the buttocks

- **Engagement** → bitrochanteric diameter (10 cm) into ANY oblique diameter
- **Internal rotation** of the anterior buttock $\frac{1}{8}$ of a circle
↳ bitrochanteric diameter occupies AP diameter of outlet
- **The anterior buttock** hinges behind the SP
- **The posterior buttock** is delivered by lateral flexion of the spine

2] Delivery of the shoulders

- **Engagement** → bis-acromial diameter (12cm) into SAME oblique diameter
- **Internal rotation** → biacromial diameter lies into AP diameter of the outlet
- **The anterior shoulder** hinges behind the SP
- **The posterior shoulder** is delivered by lateral flexion of the spine

3] Delivery of the after-coming head

- **Engagement** of the head by the occipitofrontal diameter (11.5 cm)
into the OPPOSITE oblique diameter (12-12.5cm)
- **Internal rotation** of the occiput anteriorly ($\frac{1}{8}$ → SA) – ($\frac{3}{8}$ → SP)
- **Occiput becomes anterior** → hinges behind SP → delivery by flexion

Management

• During pregnancy

- Exclude indications for CS
- Exclude CFMF
- External CEPHALIC version (done between 37 – 38 wks under tocolysis, guided by U/S with success rate 65%)

• During labor

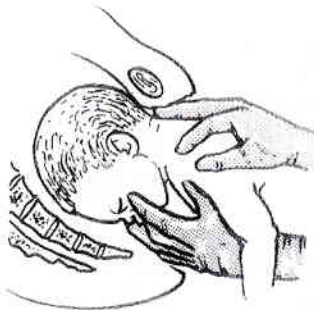
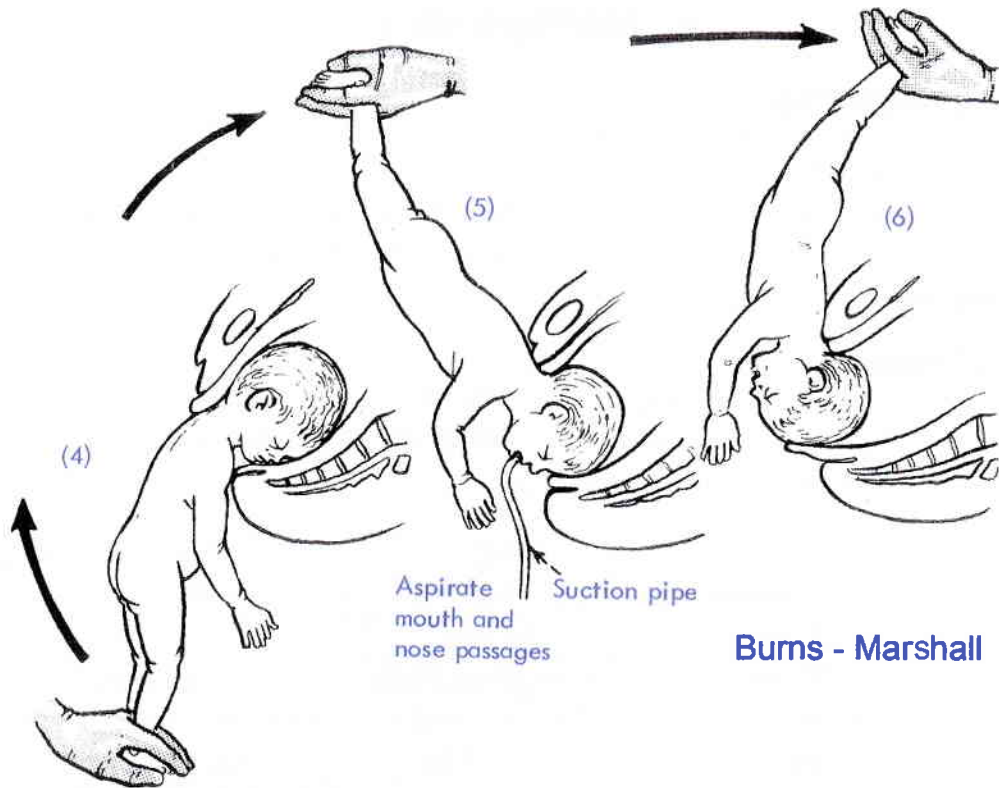
1st stage

- Guard against...inertia.....PROM.....sepsis.....
- Partogram.....analgesia.....AROM (?).....oxytocin (?).....
- Exclude indications for CS ↺

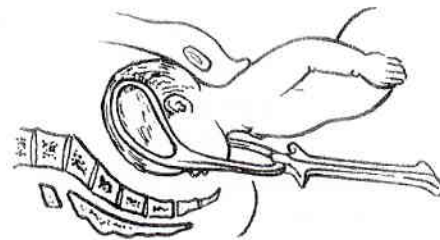
	V.D.	C.S. → + Φ
1- P. deliveries	MG	PG
2- P. breech	Mostly	
3- Type	Complete, frank	Footling, knee
4- Age	34 – 40 weeks	Preterm – Postterm
5- Weight	2 – 3.5 kg	<2 kg, > 3.5 kg
6- HEAD	Flexed	Extended (star gazing)
7- Disproportion	Not present	Any degree

2nd stage

— ① Uncomplicated —		
Spontaneous breech delivery	Assisted breech delivery	Breech extraction
Spontaneous delivery of the 3 1- Breech, 2- shoulders, 3- Aftercoming head	* Spontaneous delivery of breech * Assisting shoulders * Assisting head	Assisting delivery at the 3 levels
— ② Complicated —		
Arrest of The buttocks	Arrest of the shoulders	Arrest of the head
- At level of pelvic brim - At level of pelvic outlet	- Extended arms - Nuchal displacement	- Causes in passage - Cause in passenger



jaw flexion
shoulder traction



Piper's forceps

Advantages of Pipers forceps

- 1- Promotes flexion
- 2- Traction is directly on the head
- 3- Slow controlled delivery
- 4- Prevents head compression

-①- Uncomplicated Breech Delivery

❖ Spontaneous breech delivery

- All indications for vaginal delivery are present
- Spontaneous breech delivery occurs by the normal mechanism
- Just cover by warm towel (to prevent premature respiration)
- No interference except episiotomy (routine ✓)

❖ Assisted breech delivery

1] Breech is left to deliver spontaneously

2] Assist shoulder delivery

When shoulders descend (known by scapula) →

- Bring down the arms
- Lovset maneuver

3] Assist delivery of after coming head

* *Burns-Marshall technique*..... (rare)

- Allow fetus to hang → traction + ↑ flexion
- When sub-occipital region appears behind SP → move the baby towards the mother's abdomen

* *Mauriceau-Smellie-Veit*.....(widely used)

= jaw flexion-shoulder traction

- Left forearm → support fetal trunk on with 1 finger in mouth or 2 fingers on maxillae to increase flexion
- Right arm → hook 2 fingers over the shoulders & apply downward traction till occiput appears below SP

*** Forceps to aftercoming head.....(the best)**

- Piper's forceps → has an additional **Perineal** curve

* **Kristeller's maneuver** → suprapubic pressure to help head flexion

- ❖ **Breech extraction**For breech with extended legs: frank 📖
Rarely performed, CS is better except in

- Deliver buttocks by → . Bringing down a leg (reach the popliteal fossa, flex the knee, bring the *anterior* leg 1st) = Pinard
 - . Groin traction
- Deliver the shoulders by → . Bringing down an arm (reach the elbow, flex the forearm, bring the *post* arm 1st)
 - . Lovset maneuver
- Deliver the head by → . Burns-Marshall
 - . Mauriceau Smellie Veit
 - . Forceps

Delivery of Legs



Pressure to the popliteal space to flex the knee and displace it to the side, of the trunk.



Fingers are worked along leg towards ankle to encourage further flexion of knee.

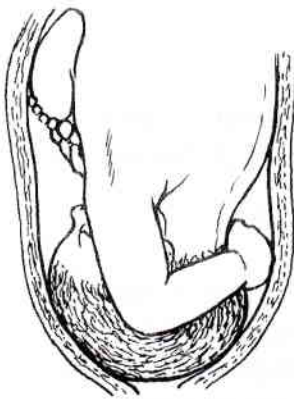


The ankle is grasped and the foot swept down over the other leg.



Grasping foot

Nuchal Displacement of the Arm



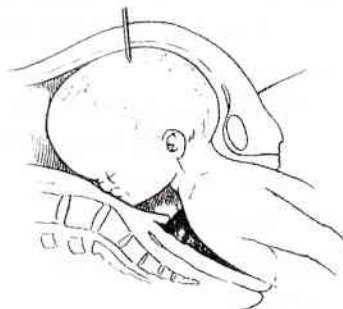
The Løvset manoeuvre is done by grasping the fetus by the pelvis and pulling gently while rotating to bring the posterior shoulder to the front. The direction of rotation is so that the posterior arm trails towards the chest (anti-clockwise rotation with back to mother's left and clockwise rotation with back to mother's right).



INCOMPLETE DILATATION OF CERVIX



Tapping



Ballantyne

-②- Complicated breech delivery

❖ Arrest of buttocks

	At the pelvic brim	
Passages	Cont. pelvis	CS
	Pelvic tumors	CS
Passenger	Large fetus	CS
	Fetal tumors	Destructive op. / CS
Power	Inertia	Correct; or
	Pendulous abd.	Breech extraction

	At the pelvic outlet	
Passages	Contracted outlet	CS
	Rigid perineum	Episiotomy
Passenger	Large fetus	CS
	Extended legs	ttt of frank breech
Power	Inertia	Correct or
	Mat. exhaustion	Breech extract.

❖ Arrest of shoulders

► Extension of the arm/s

- Bringing down an arm
- Lovset maneuver (DEPENDS ON OBLIQUITY OF THE PELVIS)
Apply traction on trunk till angle of the scapula appears below SP. Rotate the trunk 180° **keeping the back anterior** to bring the occiput anterior. This is repeated until one shoulder followed by the other is delivered

► Nuchal displacement of the arm

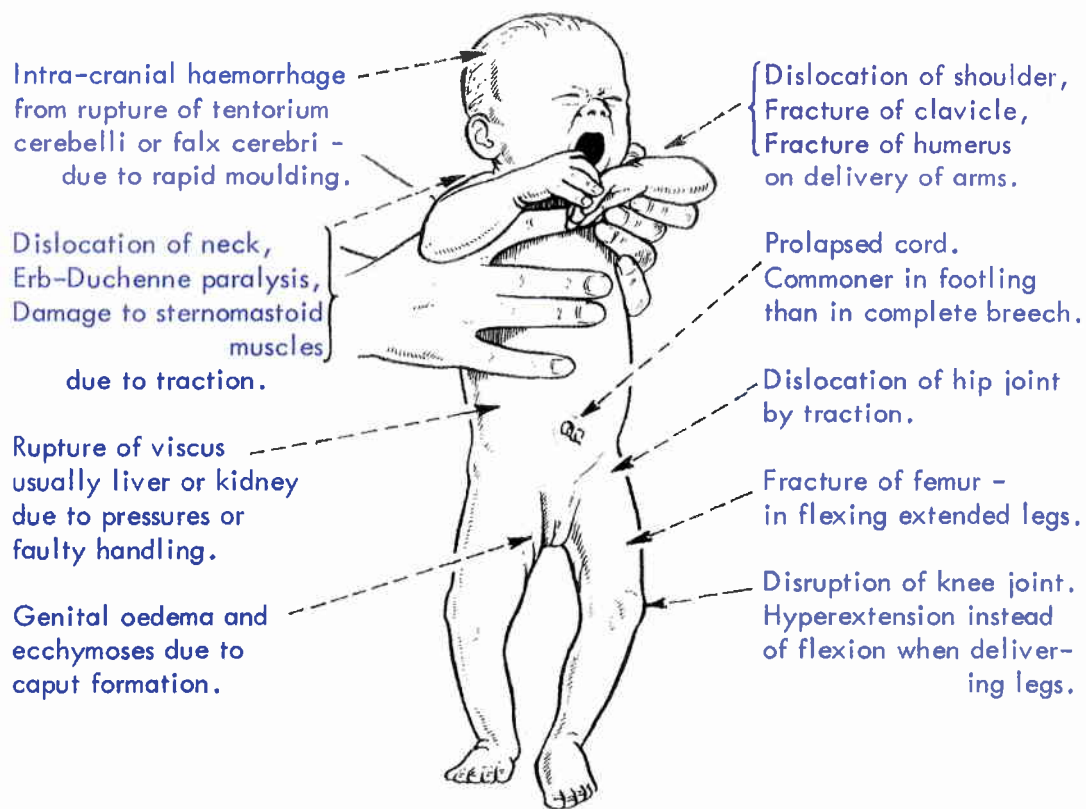
- Usually due to malrotation
- Management → proper rotation in the direction of the finger tips

❖ Arrest of the aftercoming head



Passages		Passenger	
Cause	Management	Cause	Management
Bony (CP) - living - dead	-Symphysiotomy -Perforation of head	Hydrocephalus	Perforation (Ballantyne op.)
Soft tissue (cervix incomp. dilated) - living - dead	-Duhressen incision -wait for dilatation✓	Extension of head	BM – MSV - Forceps
		Posterior rotation of occiput	- Rotate occiput ant. - MSV to deliver head face to pubis (Prague maneuver)

Breech delivery is associated with risk of injuries to the child



Complications of breech

☆ **Maternal** 1st, 2nd, 3rd stages → as in OP

☆ **fetal** How to improve fetal outcome?

① <i>Mortality</i> ①			
Complication		Cause	Prophylaxis
Hge	ICHge ✓✓	Rapid compression & de-compression (esp PTL)	Forceps to aftercoming head ± wide episiotomy
	Internal hge.	Rupture liver, spleen	Grasp the fetus from hips
Asphyxia	- Retained head	If more than 5 minutes	Nurse counts every minute
	- Premature resp.	→ meconium aspiration	Warm towels
	- Cord prolapse esp in...	Complete, footling, knee % is 10x normal	Good anticipation
Fracture	Base of skull	Undue leg traction	Bring fetal trunk to maternal abdomen only after
	Cervical spines	B-M maneuver	subocciput appears below SP

② <i>Morbidity</i> ②			
Complication		Cause	Prophy.
	Prematurity & CFMF		
Head	cephalhematoma, facial nerve palsy	Forceps	Proper technique for delivery of :-
Jaw	Perforation of mouth, mandible dislocation	Jaw flexion	
Neck	sternomastoid hematoma	Shoulder traction	
U. limb	br. plexus inj. (Erb's C _{5,6} ... Klumpke's C _{7,8})		
Abdomen	crush syndrome effect on kidney, spleen	Grasping from...	1. Buttock
Genital	perineal injury	Excess PV	2. Shoulder
L. limb	dislocation, fractures	Grasping from...	3. Head

☆ General laws for safe breech delivery

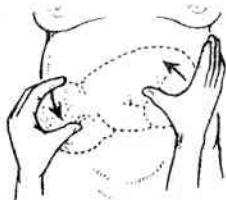
- Never to do traction in VD (most complications are d.t. traction✓)
- PG breech ⇒ CS
- Any abnormality + breech ⇒ CS ($A + B = C$)
- Nowadays most prefer for any breech ⇒ CS (d.t. the high PNM & MR)...after offering the patient ECV



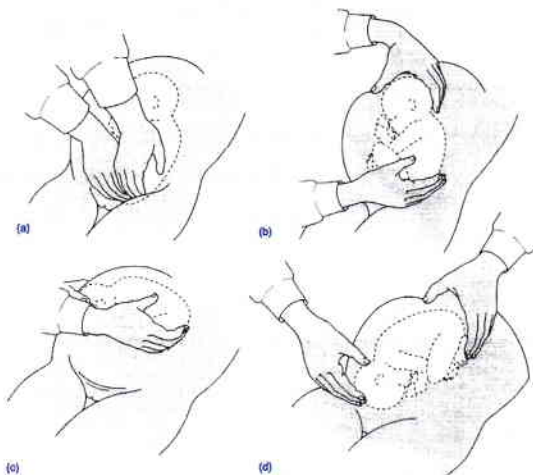
1. The breech must be eased out of the pelvis.



2. The left hand applies pressure to the head and the fetus is flexed between the two hands to allow it to slide round.



3. Once past the transverse the hands simply push the fetus into position.



External cephalic version

➔ Timing

Not < 34 weeks	Not > 37 weeks
- Spontaneous rectification may occur - Breech presentation may recur - Preterm labor may occur	Difficult as amount of amniotic fluid is less in relation to fetal size

Now.....it is better to be done at 38 weeks (under tocolysis)

➔ Technique:- 75% success

- 1] Hospitalization, tocolysis
- 2] Evacuate bladder, leave the vulva exposed (to detect any *bleeding*)
- 3] Trendelenberg position → upward dis-impaction of breech

- ▶ Approximate the 2 fetal poles (fetus gets smaller + ↑ head flexion)
 - ▶ Gently → rotate head down to pelvis & breech up to fundus
(in the direction of limbs to avoid extension of the back)

- 4] After the technique
 - Abdominal binder for a week
 - CTG
 - Anti-D if RH incompatibility
- 5] REEXAMINE after a week → REPEAT ONCE if recurred

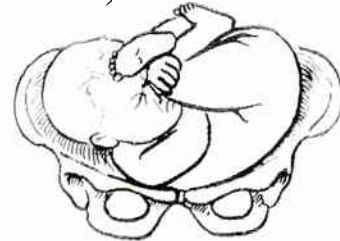
➔ Disadvantages

	Passenger	Power
Contraindication ' Causes of failure '	1) <i>Fetus</i> → . multiple . macrosomic . malformed (hydrocephalus) . Frank (extended legs) [□] 2) <i>Placenta</i> → APHge. 3) <i>AF</i> → poly, oligo- hydramnios 4) <i>Cord</i> → short, round neck	1) <i>Uterus</i> → . scar . fibroid . malformed (septum) 2) <i>Any obst. indication for CS</i> e.g. CPD
Complication	* <i>Fetus</i> → . Fetal distress . Rh -isoimmunization * <i>Placenta</i> → acc.hge. * <i>AF</i> → PROM * <i>Cord</i> → knot, prolapse	1) <i>Uterus</i> → . PTL . Rupture uterus 2) <i>Broad ligamentary hematoma</i>

⑤ Shoulder presentation

Definition

- It is transverse lie in which fetus presents by the shoulder
- The denominator is the scapula (acromion) → 4 positions
(LSA- RSA-LSP-RSP)
- Scapulo-anterior positions are more common than SP
(because in SA the concavity of the fetal abdomen fits the convexity of the maternal lumbar lordosis)



Incidence → 0.5 % (> in MG & Preterm)

Etiology

Passage	Passenger	Power
1- Soft tissue obst. → pelvic tumors	1-Fetus → <i>PT, twins</i> , CFMF 2-Placenta → <i>P. previa</i>	1- Main → CMF of uterus e.g. septate
2- Bony → <i>contracted pelvis</i>	3-Cord → short, around neck 4- A.F. → <i>Poly</i> or <i>oligo</i>	2- Auxillary → (GMP) pendulous abdomen

Diagnosis

☆ In pregnancy

➡ **History** → the abdomen is broader from side to side with decreased fundal height

➡ **Examination**

* Inspection

- The fundal level is < period of amenorrhea
- Transverse contour of the abdomen

* Palpation

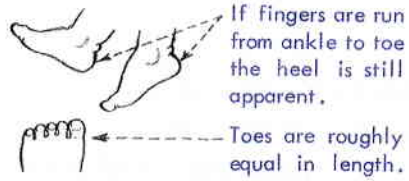
- Fundal level → < period of amenorrhea
- Fundal grip → empty
- Umbilical grip → head at one side & buttocks at the other
- Pelvic grip → empty

* **Auscultation** → heard on one side of the abdomen

➡ **U/S** → confirm diagnosis + find the etiology

The Foot and Hand may be mistaken.

FOOT



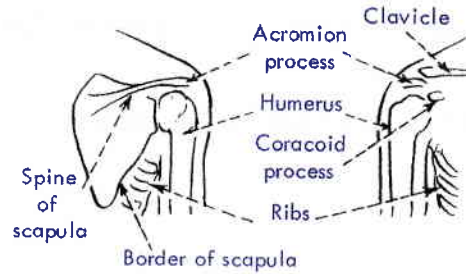
HAND

If fingers are run from wrist to palm then the 'heel' disappears.

Fingers are not equal and the thumb is separate.



Right from left is identifiable by the position of the great toe or thumb.



The Knee and Elbow may be mistaken.

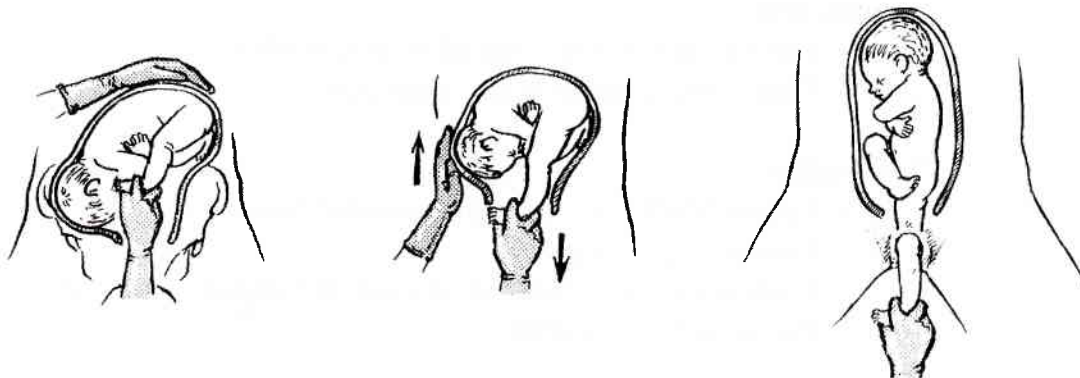
KNEE

The knee has a hollow as the knee cap is not yet formed.



ELBOW

The elbow has the point of the olecranon process.



If the liquor has drained, the uterus wraps round the fetus and manipulation is very dangerous, even with deep anaesthesia and can cause uterine rupture.

☆ In labor

- ➡ Early -----but 1st exclude....*placenta previa*
- ➡ Late-----presenting part may be:
 - * Shoulder → axilla with meeting of 3 bones with the ribs in its floor
 - * Elbow → pointed & gradually ↑ in diameter high up (while Knee is bigger & patella is felt which is rounded)
 - * Hand → differs from foot by
 - Easy flexion & extension
 - Tips of fingers form a curve (toes form a straight line)
 - In foot → calcaneum is felt

Mechanism of labor

✎ No mechanism of delivery

👤 Very rarely (Preterm or IUFD)

- **Spontaneous** version into breech
- **Spontaneous** rectification into cephalic
- **Spontaneous expulsion** → fetus folded like a V-shape → fetus expelled by the flexed trunk
- **Spontaneous evolution** → the head is retained at pelvic brim & the neck elongates → the fetus descends by its side followed by breech & lastly the head.



Management

- * In pregnancy → ✗ ECV is rarely offered
- * In labor →
 - CS ✓ even if the baby is **DEAD**
 - IPV & fetal extraction is done only if 2nd twin (small baby + roomy uterus + **INTACT** membrane)

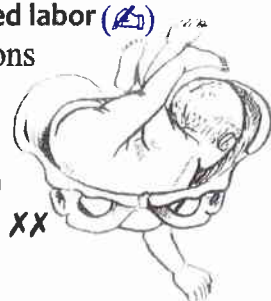
Neglected shoulder

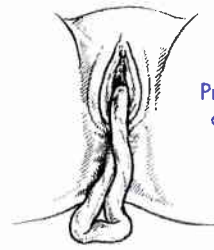
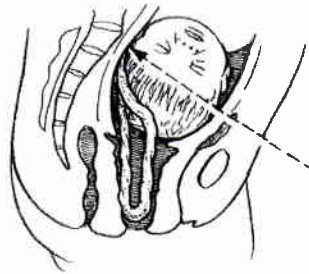
□ Clinical presentation

- Neglected cases of **transverse lie** (👤) → early ROM → prolapsed arm which become edematous → dead fetus
- There is no mechanism of labor → picture of **obstructed labor** (👤)
- Followed by **rupture uterus** (👤) → M & F complications

□ Management

- CS is the best (guard against extension of the incision)
- Destructive operations may be done → very hazardous ✗✗

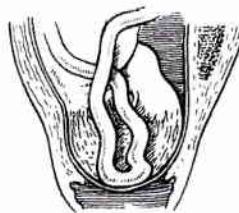




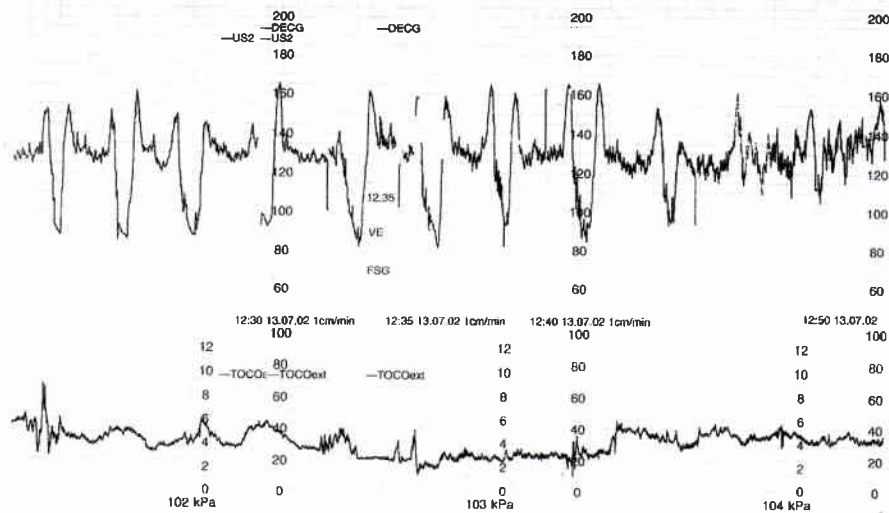
Prolapsed cord at the vulva

Once the cord is out of the uterus, and especially when out of the vagina, the fetal blood supply is obstructed, either because of the drop in temperature, or spasm of the vessels, or compression between the pelvic brim and the presenting part. If delivery is not effected within about 40 minutes, fetal death is likely.

Presentation of the cord



Occult presentation of the cord



Fetal heart rate: variable decelerations



Genu-pectoral position

⑥ Cord (funic) presentation 🚢

Definition

- Cord presentation** → Descent of umbilical cord below presenting part in the **presence** of intact membrane
- Cord prolapse** → Descent of umbilical cord below presenting part **after RUPTURE** of membrane
- Cord expression** → **occult presentation** of cord beside the head
→ fetal distress (variable deceleration in CTG)

Incidence → 0.5 %

Etiology

Same causes as in **Tr. Lie** (any factor preventing proper application of the presenting part to the cervix & LUS) +

- Iatrogenic after AROM
- Breech ✓✓ (the commonest cause) esp complete

Diagnosis

Feel the cord ⇔ Pulsating (fetus living) or Non-pulsating (dead)

Feel the membranes ⇔ Intact (cord presentation) or Ruptured (prolapse)

Treatment

- **Prophylaxis**
 - PV must be done as soon as *spontaneous* ROM occurs
 - *Artificial* ROM is only done if the presenting part is well fitted
- **In cord presentation** ⇔ CS (but no emergency),
some may try manual reposition
- **In cord prolapse**
 - **Pulsating cord**
 - The patient is transferred in knee-chest (genu-pectoral) or Trendelenberg position → to ↓ cord compression
 - According to cervix
 - * Not fully dilated or fetal distress → CS
 - * Fully dilated → forceps, ventouse or breech extraction
 - **Non-pulsating cord** ⇔ Allow vaginal delivery

⑦ Complex (compound) presentation ▲

Definition

A presentation in which there are one or more fetal limbs beside the presenting part

Incidence

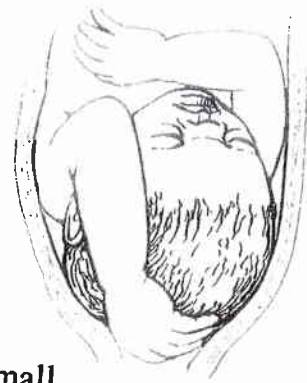
1/800

Causes

As in cord prolapse → any factor interfering with the normal application of the presenting part to the cervix & LUS

Diagnosis → P/V

feel foot or hand beside presenting part
± cord prolapse



Treatment

[1] Expectant management

Spontaneous delivery may occur if fetus is small

[2] Manual reposition → spontaneous delivery (if there are no factors obstructing vaginal delivery)

[3] Manual reposition + forceps or ventouse (if cervix is fully dilated)

[4] Cesarean section if

Cord prolapse + →

Failed progress

Fetal distress

Associated obstetric indication

[5] Craniotomy → if fetus is dead & obstructing 🙅

Types: Mixed types are more common than the pure forms ✓

	Gynaecoid 50% (best)	Android 20% (funnel)	Anthropoid [±] 25%	Platypelloid 5% (simple flat)
Inlet	Circular to transverse oval	Heart shaped (forward projected promontory)	Longitudinal oval (AP > Tr)	Transverse oval (Tr > AP)
Cavity	Shallow & wide	Deep & narrow	wide	wide
. Ischial spine	-Not projecting	-Projecting	-Projecting	-Not projecting
. Sacrum	-Concave	-Lower end incline forward	-Parallel	-Divergent
. Pelvic wall	-Parallel	-Convergent		
Outlet subpubic°	Wide (90-100)	Narrow (acute)	Narrow	Very wide
Presentation	OA	POP	DOP	DTA

1. Head behind pubis - there should be no problem of disproportion.



2. Head flush with pubis - may or may not mould and engage.



3. Head over-riding pubis and will not enter brim. caesarean section method of choice.



Naegele's pelvis



High assimilation

rickets, osteomalacia



tuberculosis



☞ Contracted pelvis ☞

Definition

- * **Anatomical definition...** ↓ of any pelvic diameter by $\geq$ ONE cm
- * **Obstetric definition.....** ↓ of any pelvic diameter to a degree that interferes with normal labor mechanism

Classification

Degrees of CP	True conjugate	CPD	Relation
Minor (1st)	10-9 cm	No	The head is flush with the inner surface of SP → normal delivery
Moderate (2nd)	9-8 cm	1st	The head is flush with outer border of SP → trial of labor
Severe (3rd)	8-6 cm	2nd	The head overrides the outer surface of SP → CS
Extreme (4th)	< 6 cm		

Etiology Φ Φ

1] Congenital and developmental

- Small GYNAECOID (generally contracted pelvis)
- Small ANDROID or ANTHROPOID or PLATYPELLOID
- *NAEGELE'S* pelvis (congenital absence of one ala of sacrum) [Ⓜ]
- *ROBERT'S* pelvis (congenital absence of both ala of sacrum)
 - HIGH ASSIMILATION pelvis (sacrum → 6 vertebrae)
 - LOW ASSIMILATION pelvis (sacrum → 4 vertebrae) ✕
- *SPLIT* pelvis (gaped SP ± ectopia vesica)
- *OTTO* pelvis (deep acetabulum)

2] Diseases of vertebral column

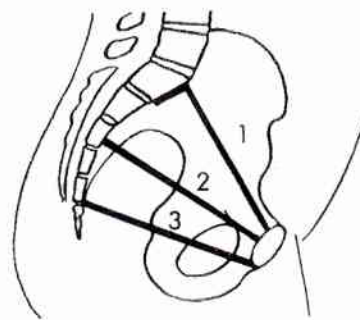
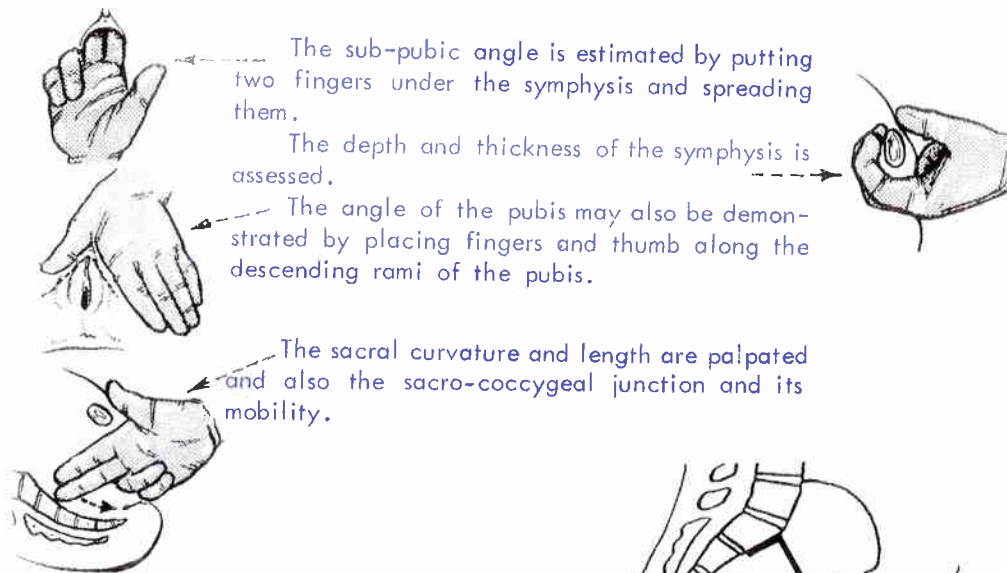
- Lumbar Kyphosis, Scoliosis
- Spondylolisthesis (slipping of L₅ on the promontory)

3] Diseases of pelvis

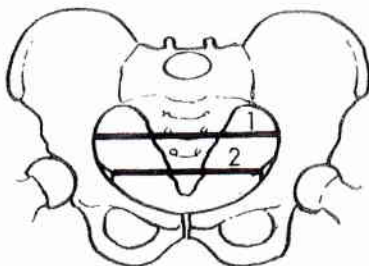
- *RICKETS* ⇔ . Wide Tr. + narrow AP diameter → *rachitic flat pelvis*
 . If disease occurs after walking → *pseudo-osteomalacic*
- *OSTEOMALACIA* ⇔ *Tri-radiate pelvis* (promontory is pushed forwards + acetabula are pressed inwards)

4] Diseases of lower limbs

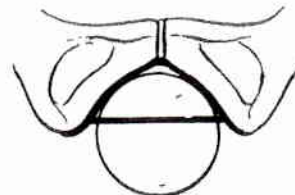
- Poliomyelitis / Fractures / T.B. / dislocation of the hip joint
- Usually unilateral → oblique pelvis (weight is thrown on the sound leg)



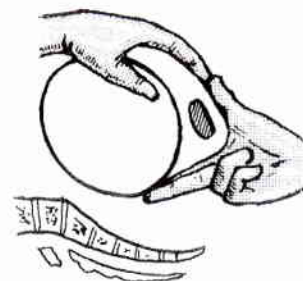
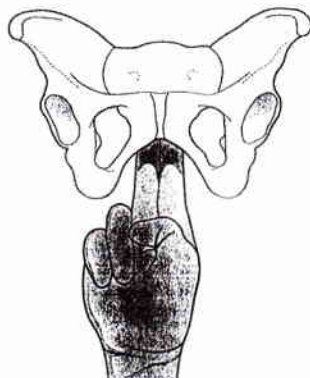
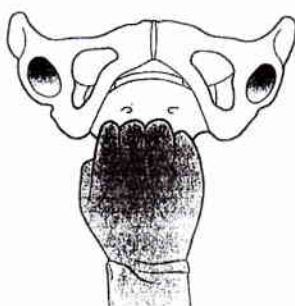
THE ERECT LATERAL VIEW allows measurement of the sagittal diameters of the brim, and inspection of the sacrum and lower vertebrae.



THE ANTEROPOSTERIOR VIEW allows measurement of the transverse diameter of the brim, and the interspinous diameter. It gives some idea of the pelvic shape.



THE OUTLET VIEW shows the shape of the subpubic arch. Various mensuration techniques were used to predict whether or not the head would emerge safely under the arch, but none were reliable.



Diagnosis

► History

- *Past history* → disease of spine, pelvic bones, LL, Rickets
- *Obstetric history* → bad history (difficult-traumatic labor)

► Examination

* General examination

▪ Appearance

- Feminine (gynaecoid pelvis)...Masculine (android)
- Dystocia dystrophia syndrome → android pelvis

▪ Height (if < 150 cm → pelvis is usually small ^u)

▪ Gait (for limping)

▪ Skull & chest (for rickets)

▪ Examination of vertebral column

* Abdominal examination

- Malpresentations } Pendulous
- Non-engagement } abdomen

► Pelvimetry

① Clinical pelvimetry

⇒ External

Inlet		Outlet	
Interspinous diam (25 cm)	Between ASIS	Bituberous diam (11 cm)	put fist bet. ischial tuberosities + add 1 cm for fat
Intercristal (27.5 cm)	Between farthest points on iliac crest	Thom's rule (15 cm)	Bituberous + Posterior sagittal
External conjug. (20 cm)	Upper border SP → sacral promontory	Subpubic angle	Not < 90°

⇒ Internal

- Diagonal conjugate (12.5 cm). Subtract 1.5 → true conjugate
- Interspinous diameter & protrusion of ischial spines (✓)
- Subpubic angle (✓)

② Radiological pelvimetry (Not done now)

⇒ Lateral view → AP diameters

⇒ Brim view (supero-inferior view) → inlet pelvimetry (semisitting)

⇒ Pubic view → outlet pelvimetry (the patient leans forwards with the abdomen between the aparted legs)

Diagnosis Of Disproportion (CPD)

This is the most important parameter (done at 37–38 wks) as:

- a small pelvis may allow normal labor if the fetus is small *while*
- a normal pelvis may not allow a macrosomic fetus to pass

- ⌘ **Pinard maneuver**.....The head is grasped with the left hand and pushed into the pelvis. Palpate the anterior surface of the SP with the fingers of the right hand
- ⌘ **Muller test**.....The head is pushed into the pelvis by the assistant. 2 fingers of the examining Rt hand are placed into the vagina with the left hand over SP
- ⌘ **kerr's modification of Muller test** ✓....The head is pushed into the pelvis with the left hand of same physician. 2 fingers of Rt hand are placed into vagina with thumb over the SP

Complications

👤 During pregnancy

- Pendulous abdomen / Malpresentations / non-engagement
- Liability to recurrent UTI (pressure on ureters)
- If the sacral promontory is protruding & uterus is RVF
 - ↳ incarceration → abortion or anterior sacculation

👤 During labor

- 1st stage - Prolonged labor
 - PROM → liable to cord prolapse, infection
- 2nd stage
 - . Obstructed labor → rupture uterus ✓
 - . Necrotic VV fistula (rare now)
- 3rd stage - PPHge (atonic or traumatic)
 - Puerperal sepsis
 - Injury to pelvic joints / nerves by poor forceps application

👤 Fetal

- F. asphyxia (prolonged / obstructed labor)
- F. hge → ICHge (excessive moulding or forceps)
- F. injury → fracture skull, injury of brachial plexus / facial n.
- F. infection
- F. death

Management

- ▶ Minor° CP ⇔ no CPD
 - ↳ allow delivery
- ▶ Moderate° CP ⇔ 1st ° CPD
 - ↳ trial of labor
- ▶ Severe° CP ⇔ 2nd ° CPD
 - ↳ CS (craniotomy if dead)
- ▶ Extreme° CP
 - ↳ CS (whether alive or dead)

✧ Trial of labor ✧

This is a test for engagement of the head

Value → in 1st ° CPD to determine possibility of vaginal delivery [±]

✧ The following factors may facilitate engagement & delivery

- Some degree of *moulding & asynclitism*
- *Pelvic give* → relaxation of pelvic joints & ligaments
- Efficient *uterine* contractions
- Progressive *cervical* dilatation

✧ Prerequisites (what are CONTRAINDICATIONS for trial of labor ?) [±] ΦΦ

- PG (MG → responds to obstruction by.....)
- Young (Elderly PG → CS)
- Healthy (if associated disease → trial of labor will be a burden)
- . 1st ° CPD
- . Outlet not contracted
- No fetal distress or placental insufficiency
- . Vertex presentation (better → OA)

✧ Technique

□ 1st stage

- Guard against (inertia + PROM + Infection)
- Active management of labor → Partogram
 - . If reaching *alert line* → correct inertia (general lines ± oxytocin)
 - . If reaching *action line* → protracted or arrest disorders) → CS

□ 2nd stage: Allow 2 hours for engagement after full cx dilatation

- . If not engaged → CS
- . If engaged → vaginal, forceps, ventouse

❖ Delivery of special types ❖

1] Generally contracted pelvis

- Normally shaped pelvis but small in size with ↓ in all its diameters
- Arrest may occur at the level of
 - Inlet → delayed engagement
 - Midcavity → arrest of rotation
 - Outlet → delayed exit

2] Flat pelvis

- A pelvis with APD < TrD of the inlet
- Engagement occurs in the transverse diameter through asynclitism
→ overcome the short APD
 - In *simple flat pelvis* ✗ (AP is ↓ at the inlet, cavity, outlet) → failed rotation → DTA
 - In *rachitic flat pelvis* ✓ delivery is possible (as AP is ↓_{ed} only at the level of inlet, while the outlet is ↑_{ed} d.t. backward shift of the tip of the sacrum with wide subpubic angle)

3] Contracted midcavity

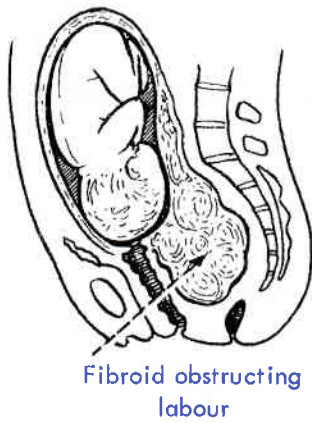
- Jutting spines with ↓ interspinous diameter → tr. arrest of the head
- Management ⇨ best is by CS, as:-
 - Rotation by forceps is hazardous
 - Use of oxytocin → more obstruction → rupture uterus

4] Contracted outlet (Funnel pelvis)

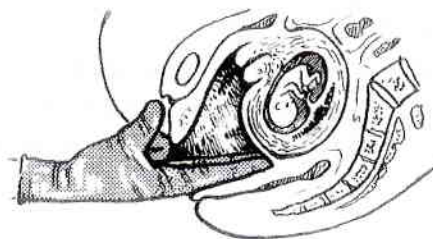
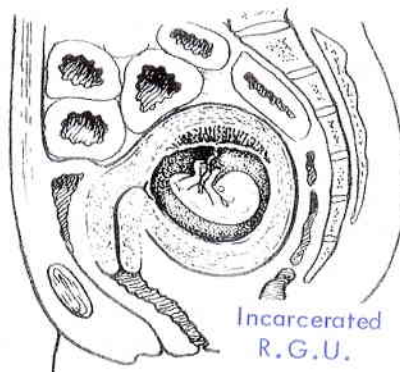
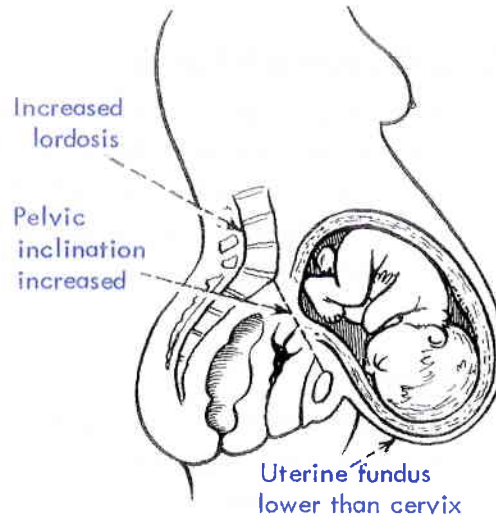
- Caused by → android, anthropoid, high assimilation pelvis
lumbar Kyphosis, spondylolisthesis, osteomalacia
- Mechanism → according to Thom's rule
 - If < 15 cm → CS
 - If > 15 cm → according to pubic arch:
 - . Wide: normal delivery
 - . Narrow: forceps + generous episiotomy

5] Oblique pelvis

- Caused by → Naegel's pelvis, scoliosis, diseases affecting one LL
- Mechanism (rare) → if head engages in the normal oblique diameter



Pendulous Abdomen



Manual Correction

Soft tissue obstruction



□ GENITAL

- Vulval & vaginal (stenosis, congenital atresia & septa)
- Cervical (1st or 2nd dystocia)
- Uterine (pendulous abdomen, rudimentary horn)

□ URINARY (full bladder, pelvic kidney)

□ TUMORS (fibroid, ovarian, cervical).... ⇒ look Gyna

❖ Pendulous abdomen

Definition ⇒ divarication of recti → uterus may fall forward and even may over-ride the symphysis pubis

Etiology ⇒

- Multiparity (laxity of the abdominal & uterine muscles)
- Contracted pelvis
- Over-distended uterus

Effects

- Pregnancy.....discomfort
- Labor.....Malpresentations & non-engagement
Prolonged labor & rupture uterus

Management

- Pregnancy.....abdominal binder
- Labor.....CS one if (prolonged, obstructed, CPD)

❖ Retroverted gravid uterus (10%)

Fate of RVF gravid uterus ⇒

- Usually RVF is corrected spontaneously by 10–12 wks.
- Incarceration "*incarcerated RVF*" is due to (very rare):
 - Pelvic adhesions
 - Posterior wall myoma
 - Jutting sacral promontory (CPD)

Complications

- Spontaneous abortion → between 14–16 wks
- Anterior sacculation → rupture uterus
- Retention of urine

Management

* For anterior sacculation

- In early pregnancy → manual correction is tried
 ↳ If failed laparotomy is done to free adhesion
- In late pregnancy → CS

* If there is retention.....slow evacuation of urine by a catheter

Abnormal uterine action :-

Hyperfunction	Hypofunction	Incoordinate uterine activity
Precipitate labor	Hypotonic uterus (inertia) [1 ^{ry} & 2 ^{ry}]	- Colicky uterus - Tonically contracted uterus
Obstructed labor	Cervical dystocia [1 ^{ry} & 2 ^{ry}]	- Hypertonic LUS - Contraction (constriction) ring

Precipitate labor

Definition

- . Labor occurs rapidly in very short time
- . The whole process takes < 3 hours

Etiology: unknown but needs → Multiparity +

- Strong frequent uterine contractions
- Small baby
- Lax pelvic floor + roomy pelvis

Complications

1] Maternal [▪]

- Acute inversion (later on: *prolapse*)
- PPHge (*atonic* + *traumatic*)
- Puerperium → S₃

2] Fetal

- Fetal distress (↑^{ed} uterine contractions)
- Fetal trauma ± avulsion of the cord
- Fetal ICHge (rapid compression decompression)

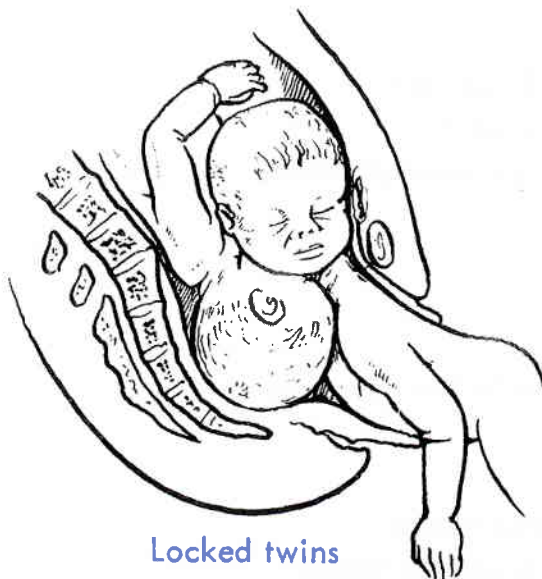
Management

⇒ Prophylactic

If there is previous history →
hospitalization + bed rest before time of delivery

⇒ Active

- **E**pisiotomy → to avoid tears
- **E**UA → to exclude genital tract trauma
- **E**xamination of the fetus → to exclude trauma



Locked twins

Obstructed labor

Impending rupture of uterus -- Tonic contraction & retraction
Pathological retraction ring (of Bandl)

Pathophysiology

- Obstruction to the passage of the fetus
- Response of the uterus → esp in MG (as PG responds by inertia)
 - UUS → ↑^{ed} contraction & retraction → thicker & shorter
 - LUS → dilatation & thinning
 - Between them → retraction ring ↑^{es} (becomes higher & deeper)
- If the condition is not relieved → rupture LUS

Etiology

Fetal	Maternal	
* Fetal macrosomia (10%) Generalized / localized * Malpresentations & (25%) malposition (esp shoulder) * Locked twins	Bony	Soft tissue
	-Contracted pelvis (50%) ✓	. Vulval & vaginal . Cervical . Uterine . Ovarian
	-Pelvic bony tumors	

Clinical picture

(usually MG, neglected)

↳ Symptoms

- Prolonged labor with early ROM
- Strong frequent uterine contractions
- Fetal movements may stop

↳ Signs

- **General**
 - Exhaustion, anxiety
 - Dehydration → ↑pulse, ↑temp, ↑Resp
 Dry tongue, oliguria (acetone +ve)
- **Abdominal**
 - Hard tender uterus moulded over fetus → difficult to feel fetal parts
 → may feel retraction ring
 - FHS → fetal distress or death
- **Vaginal**
 - Vulva & vagina → warm, edematous
 - Cervix → usually fully dilated, edematous lips
 - Presenting part → unengaged, ↑^{ed} caput, over-moulding
 - + Cause of obstruction is detected e.g. → CPD, prolapsed arm

Differential diagnosis

- Constriction (contraction) ring
- Fundal fibroid
- Full bladder

Complications

Maternal (High MMR)	Fetal (High PNMR)
- PPHge (rupture ✓ or atonic) - Puerperal sepsis . Prolonged labor . PROM . Maternal exhaustion . Excess interference - Large necrotic VVF	- Fetal <i>distress</i> (asphyxia) - Fetal <i>death</i> - Fetal <i>trauma</i> - Fetal <i>infection</i> (intrauterine & neonatal) - ICHge

Treatment

* Prophylactic (much ✓ more important)

- Proper management of labor →
 - Proper antenatal care
 - Proper intranatal care
 - . Empty bladder & rectum → ↓ reflex inhibition
 - . Good analgesia → ↓ anxiety & fear
 - . Correct dehydration → IV fluids
 - . Antibiotics in prolonged labor (esp in PROM)
 - Close monitoring of labor progress (partogram)
 - Proper use of ecbolics
- Proper management of the etiology e.g.
 - When to consider a fetus macrosomic ?
 - When to allow face or breech to deliver vaginally ?
 - How could you misdiagnose shoulder presentation ?

* Active

- Resuscitation → fluids + analgesics
- Cesarean section.....USCS 🐼
(safer than destructive operations; even if the baby is dead)
- Proper neonatal resuscitation

Q..... Discuss prolonged labor 🐼 ??

Q..... Discuss obstetric trauma 🐼 ??

Hypotonic uterine inertia

Definition: prolonged labor d.t. weak contractions of UUS
(↓ FREQUENCY, AMPLITUDE, DURATION)

1^{ry} → slow dilatation of cx from start → prolonged (protracted) labor

2^{ry} → . Arrest of → cervical dilatation
 . Arrest of → fetal descent
 . Arrest of → placenta (retained placenta)

Etiology

- **Power** → as in atonic PPHge
- **Passage** → as in contracted pelvis
- **Passenger** → as malpresentations & malposition
- **Maternal** → elderly PG, GMP, dystocia dystrophia \$

Comp.

Maternal	Fetal
- PPHge (atonic ✓ or retained pl.)	- Fetal (4) d.t. the prolonged labor
- Puerperal sepsis d.t. (4)	

Treatment

* Prophylactic (much ✓ more important)

- Proper management of labor ⇄
- Proper management of the etiology

* Active management

- 1st stage ⇄ uterine stimulation: AROM → if > 1 hr
 ↳ give oxytocin by IV drip
- 2nd stage ⇄ forceps, ventouse, breech extraction
 ↳ if no progress → CS
- 3rd stage ⇄ massage + ecbolics (methergine)
 ↳ if failed → manual separation of placenta

Cervical dystocia

Definition

PRESENCEof a cervical cause

LEADINGto inadequate cervical dilatation

IN SPITEof presence of good uterine contractions

Etiology Fibrosis (cerclage, amputation, cautery, cx tumors)

Comp.Prolonged laborrupture uterus

TTTProper management of labor ⇄

Differential diagnosis

	Retraction ring	Contraction ring
General	Signs of obstruction	Normal
Abdominal	Ring is deep (seen or felt)	Ring can't be seen or felt
Site:-	Junction of UUS & LUS	Usually around a groove
Local	Signs of obstruction	Normal
Comp:-	Rupture uterus	No danger

Incoordinate uterine action

► Colicky uterus

- Part or all of the UUS contracts irregularly
- C/P → abdominal **pain** & tenderness

► Tonic contraction of uterus

- The whole uterus contracts on the fetus → arrest of labor
- C/P → **severe** abdominal pain + **fetal distress**

► Hypertonic LUS

- There is reversed polarity (contraction of LUS & relaxation of UUS)
- C/P → marked persistent lower abd pain & **backache**

Management of the above types

- * **General** → + uterine relaxants & antispasmodics
- * **Operative interference** if above measures fail

► Contraction (constriction) ring

- **Definition** → localized annular spasm of circular muscle fibers
Usually around a groove
- **Etiology**
 - Malpresentation & CPD
 - Maluse or irregular use of ecbolics
- **Sites & C/P**
 - If in 1st stage → between UUS & LUS ✓✓.....prolonged labor
 - If in 2nd stage → between neck & head of fetus.....obstructed labor
 - If in 3rd stage → hour glass uterus.....retained placenta

O/E → the ring may be felt vaginally
- **Treatment**
 - * **Prophylaxis** → avoid Pdf
 - * **Active**
 - 1st stage
 - sedatives (as Pethidine)
 - antispasmodics (as NO₂ or MgSO₄)
 - 2nd stage
 - either GEA or amyl nitrite (IV or inhalation)
 - if the ring relaxes → forceps
 - if failed → CS (m.b. done vertical; why?)
 - 3rd stage → manual removal of the placenta under anesthesia

PROLONGED / ARREST OF LABOR



Definition

Delay of either of cervical dilatation or fetal head descent

Due to alteration of the normal mechanism of labor

Taking more than the normal time

1st stage.....8-16 hour (4-8 in MG)

2nd stage.....1-2 hour (1/2 – 1 in MG)

3rd stage.....15-20 m (5-10 in MG)

Etiology

• General factors

- Dehydration
- Over sedation / excessive fear
- Full bladder / rectum

• Local factors

- Power.....uterine inertia (atony)
 - . Over distended uterus (polyhydramnios, twins)
 - . Maternal exhaustion (anemia, PET)
 - . Malformed uterus (septum, fibroid)
- Passenger
 - . Malpresentations e.g. OP, face
 - . Fetal macrosomia (DM)
- Passage
 - . Contracted pelvis
 - . Soft tissue obstruction

Diagnosis

- ▶ **Normal progress** of labor is known by partogram (the diagrammatic representation of labor events) divided into 2 components

• Fetal component

- FHS → / 15-30 min in 1st stage, / 5 min in 2nd stage
- Descent of presenting part → known by the station
- Amniotic fluid examination → meconium, purulent, bloody

• Maternal component

- Vital data (B.Pr., pulse, temp)
- Uterine contractions → document → frequency, duration
- Cervicogram

- ▶ **Abnormal progress** is known by the *alert & action* lines

- Alert line → if there is a 2 hour delay
- Action line → if there is a 4 hour delay

- ▶ **Abnormal labor patterns**

- 1] Prolonged latent phase
- 2] Protraction disorders (cervix & descent)
- 3] Arrest disorders (cervix & descent)

Complications

- Maternal
 - PPHge (atonic)
 - Puerperal sepsis
 - . Prolonged labor
 - . PROM
 - . Maternal exhaustion
 - . Excessive interference
- Fetal
 - Fetal distress (asphyxia)
 - Fetal death
 - Fetal trauma
 - Fetal infection
 - F. ICHge

Management

- Prophylaxis (proper management of labor)
 - a. Proper antenatal care....CS for macrosomia
 - b. Proper intranatal care
 - . Empty bladder & rectum → ↓ reflex inhibition
 - . Good analgesia → ↓ anxiety & fear
 - . Correct dehydration → IV fluids
 - . Antibiotics in prolonged labor (esp in PROM)
 - c. Partogram (close monitoring of labor progress)
 - d. Proper use of ecbolics
- Active
 - **First stage*
 - Correction of any possible etiology e.g. AROM if was not done
 - o This leads to . Liberation of prostaglandins
 - . Proper application of the head to the cervix
 - . Shows the character of amniotic fluid
 - o One hour later, if uterine contractions are still inadequate
 - augmentation of labor by oxytocin drip
 - Continuation of labor under close monitoring + prophylactic antibiotic
 - C.section if delay more than 4 hours (action line has reached)
 - **Second stage*
 - o PG → 2 hours. MG → 1 hour
 - o Any delay → reassess:
 - . If engaged → ventouse or forceps
 - . If not engaged → CS
 - **Neonatal resuscitation*

Chapter

3

Fetology

FWB+

IUGR

Fetal death

Macrosomia

PTL

Postterm

PROM

Polyhydramnios

Twins

RH - incompatibility

CFMF

Assessment OF Fetal Wellbeing

oops!

-- Antepartum --		-- Intrapartum --	Postpart
FWB	CFMF	Clinical	
Symptoms Cardiff count to 10	Biopsy CVS – PGD	. Partogram . Amniotic fluid	APGAR scoring system
Signs . General . Abdominal	Imaging U/S – CT – MRI	Electronic (CTG) - Internal (better) - External	Appearance Pulse Grimace Attitude Respiration
Investigations . U/S . Doppler . Fetal monitoring - CTG - BPP	Endoscopy - Amniocentesis - Cordocentesis - Embryoscopy - Fetoscopy	Biochemical Scalp PH >7.25 → normal 7.2-7.25 → borderline <7.2 → acidosis → interfere	



Antepartum assessment of FWB

1) Symptoms ⇒ daily fetal kick chart or “Cardiff-count-to-ten”

○ **Technique**

- Count fetal movements **after** breakfast
- Note the time on completing **10** kicks
- This is repeated daily from **32 wk** onwards

. *Normally* → > 1 FK / hr
 . *Abnormal* - if occurred in > 10 hrs or
 - if they took double her normal

○ **Advantages** ⇒ easy to perform

○ **Disadvantages**

- Subjective method (kicks may not be felt well)
- Not suitable alone in high risk pregnancies (HRP)

2) Signs (not accurate)

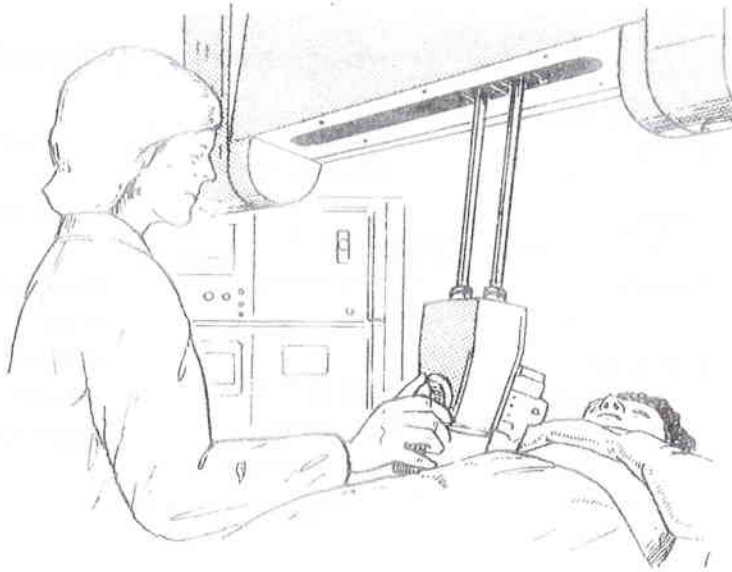
○ **General** ⇒ progressive wt gain (in absence of *edema*, *overeating*, *polyhyd.*)

○ **Abdominal**

- GRAVIDOGRAM → progressive ↑ in FL above SP (1cm /wk after 20 wk)
- ABDOMINAL GIRTH → progressive ↑ in abdominal circumference

3) Investigations ↺

ULTRASOUND



Femur length (FL)



Biparietal diameter (BPD)





Ultrasound



.....Idea.....

- Use of sound waves with frequency above range of human hearing.
- The equipment changes sound waves to electric waves. Transducer is put on the abdomen through gel (as waves don't pass gas). Reflection (echo) depends on different tissue densities.
- * Hazards → safe for both mothers & fetus[□]
 - ↳ while: **X-ray** → . CFMF or death or ↑ malig. at infancy
 - . affection of maternal gonads
- * Two approaches
 - . Trans-abdominal (1.5 MHz[□]) → wide image[□] but less sharp
 - . Trans-vaginal (7.5–15 MHz[□]) → more sharp but limited area

.....Uses in obstetrics.....

► Diagnostic

- FETUS → - Fetal life, site (ectopic), number (twins), CFMF
 - Biometry (BPD, TAD, TTD, FL, HL)
 - Early (crown-rump length)
- AMNIOTIC FLUID → volume, *turbidity* (for lung maturity)
- PLACENTA → position, hge, *calcification* grade 0,1,2,3 (for lung maturity)
- UTERUS → uterine anomalies, fibroids, remnants after delivery or abortion
- CERVIX → diameters (for patulous internal os)

► Therapeutic

- . Amniocentesis, cordocentesis
- . Fetal therapy → fetoscopy

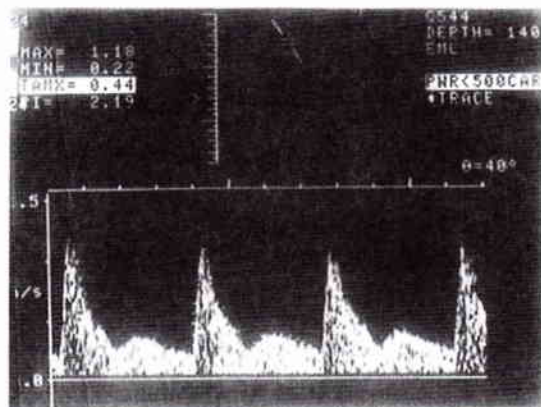
.....Uses in gynecology.....

► Diagnostic

- CONGENITAL → uterine agenesis, double uterus
- TRAUMATIC → perforated IUCD
- INFLAMMATORY → pelvic abscess, chronic PID
- NEOPLASTIC → . Doppler differentiates *benign* from *malig.*
 - . Postmenopausal cut of value is 4–5 mm (endomet)
- INFERTILITY - Diagnosis of etiology (ovarian, uterine)
 - Folliculometry
 - Saline sonohysterography

► Therapeutic

- . Ovum collection in ART
- . Percutaneous aspiration of cysts e.g. functional, abscess

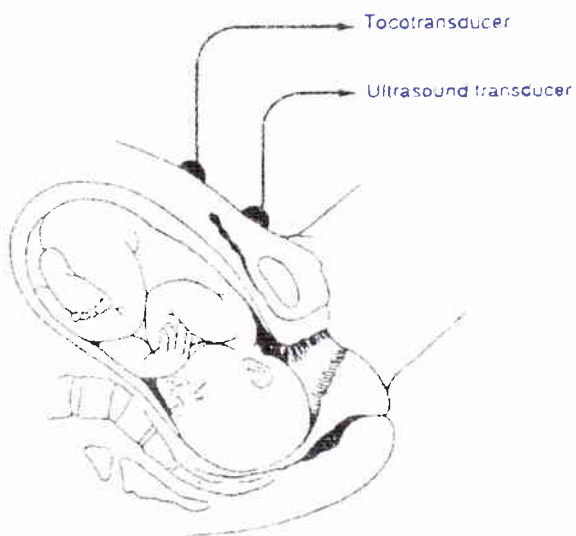


- *early diastolic notch*
- *for screening of PET*
- *at 20 wks gestation*

Uterine artery waveform with diastolic notch

History

The Doppler phenomenon was first noted by an Austrian mathematician, Christian Doppler (1803–1853), in relation to the change in pitch of an approaching and receding sound source. Ultrasonic Doppler was first used in medicine to study cardiac function in 1957, and the use of ultrasound to image internal structure was pioneered in obstetrics by Ian Donald (1910–1987), Professor of Midwifery in Glasgow.



②

Doppler ultrasound

○ Idea

- Doppler is used to measure blood flow & velocity
- **Johann Christian Doppler** shift principle: The echoes reflected from a moving object is directly proportional to their velocity. Thus U/S reflects echoes from moving RBC's in different blood vessels.

○ Types of Doppler

- Sonicaid → if flow is changed into sound → hear FHS
- Colored Doppler → differentiates artery from vein, systole from diastole
- Duplex → adds cross sectional diameter (esp imp in DVT)

○ Uses

Obstetrics → . Assess fetoplacental circulation (uterine, umbilical & cerebral vessels) in cases of placental insufficiency

esp - PET → **EARLY DIASTOLIC NOTCH**

- IUGR → **EARLY DETECTION** < pathology

. Diagnosis of fetal anemia (RH incompat.) → ↑ velocity

. Diagnosis of cardiac anomalies

Gynecology → suggest the nature of suspicious swellings (benign or malign)

⚡ **Different Waveform Indices used**

- Systolic / diastolic ratio = S/D ratio
- Resistance index = $(S-D) / S$
- Pulsatility index = $(S-D) / \text{mean}$
- * Diastolic flow at 1st → decreased, stopped, reversed
- * Finally → systolic flow ceases

③

Fetal monitoring

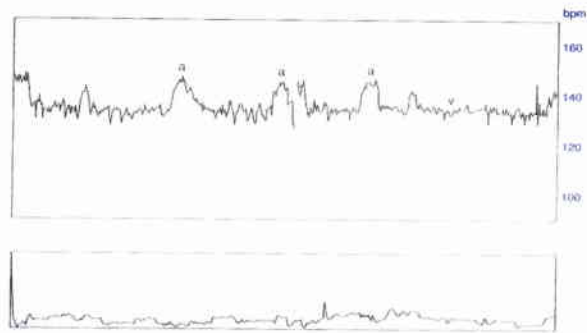
- Graphic recording of fetal cardiac & uterine activity
- Monitoring is either external or internal (only in labor)
- Done after 32 weeks d.t. → fetal viability, nervous system is well developed

[1] Fetal heart rate (FHR) N: 120–160: tic-tac rhythm

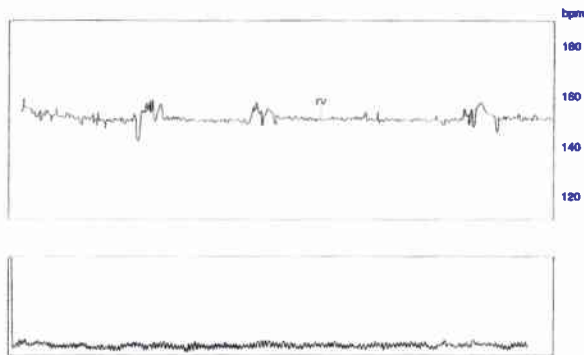
- Tachycardia (>160) → pyrexia, infections, stress, drugs
- Bradycardia (<120) → most dangerous (late sign of stress)

[2] FHR variability (beat-to-beat variations) BTB

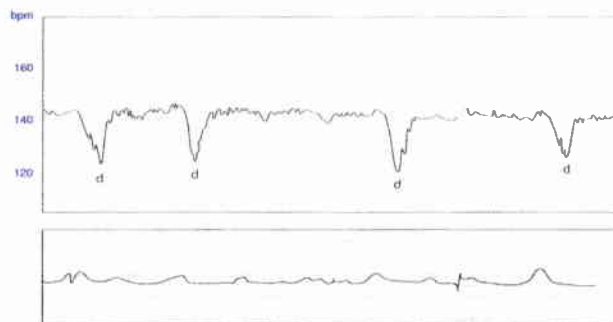
- This is normal (fetal heart receives impulses from both symp. & parasymp. systems) → short term & long term variability
- Its disappearance denotes fetal distress[□]
- It has 2 components $\lambda^{\square}$
 - .Amplitudethe height from the base to the max of the cycle
 - .Frequencywaviness of the whole trace in a cyclic fashion / m



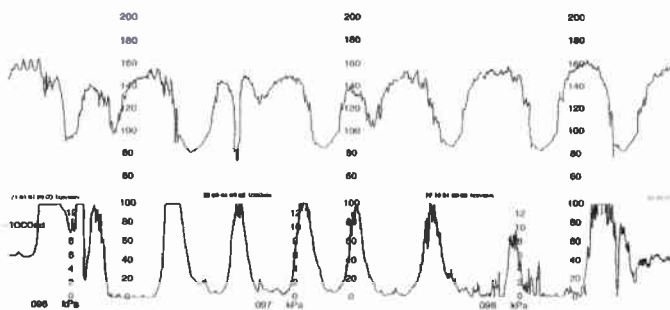
A normal fetal cardiotocograph showing a normal rate, normal variability (v), and the presence of several accelerations (a)



A fetal cardiotocograph showing a baseline of 150 beats per minute (bpm) but with reduced variability (rv)



An admission cardiotocograph from a term pregnancy. Although the baseline fetal heart rate is normal, there is reduced variability, an absence of fetal heart rate accelerations, and multiple decelerations (d). The decelerations were occurring after uterine tightening and are therefore termed 'late'



Fetal heart rate: late decelerations

[3] Accelerations

- Normally when fetal movement occurs → symp. stimulation
- Reflex tachycardia which returns to baseline after movement stops

👉 **Non-stress Test (NST)** ✓✓ the used one

○ **Method**

- . FHR is continuously recorded for 20 – 40 min. (after VAST)
- . Normally → FHR accelerates in response to fetal movement

○ **Results**

- *Reactive test* (-ve) ⇔ 2 acc of at least 15 b/m in 20 min
- *Non-reactive* (+ve) ⇔ < 2 accelerations in 40 min

[4] Decelerations

- Normally, the placental blood flow allows sufficient oxygenation of the fetal blood to maintain metabolism during uterine contractions.
- If this flow is ↓ed with no O₂ reserve in fetus → anaerobic met. → lactic acidosis + ↑ CO₂ → CNS & cardiac depression → decelerations that corrects gradually on resumption of placental flow after ut. relaxation
- ❑ *Type I dips (early)* → normal (nervous reflex) [■]
 - A mirror image to uterine contractions.
 - Due to fetal head compression → stimulation of vagal tone
- ❑ *Type II dips (late)* → distress (metabolic acidosis) [■]
 - Recovery of the FHR is delayed till after contraction ended
- ❑ *Variable* (timing, duration) → cord compression (mechanical) [■]

👉 **Contraction stress test (CST or OCT)** ✕✕ not done

○ **Idea**

- Oxytocin is given (or by nipple stimulation!!) to induce *physiological* contractions → 3-5 /10 min each lasting 40 sec
- Dangerous test: - fetal hypoxia if there is borderline placental func.
- contraindicated in → scars, PTL, twins

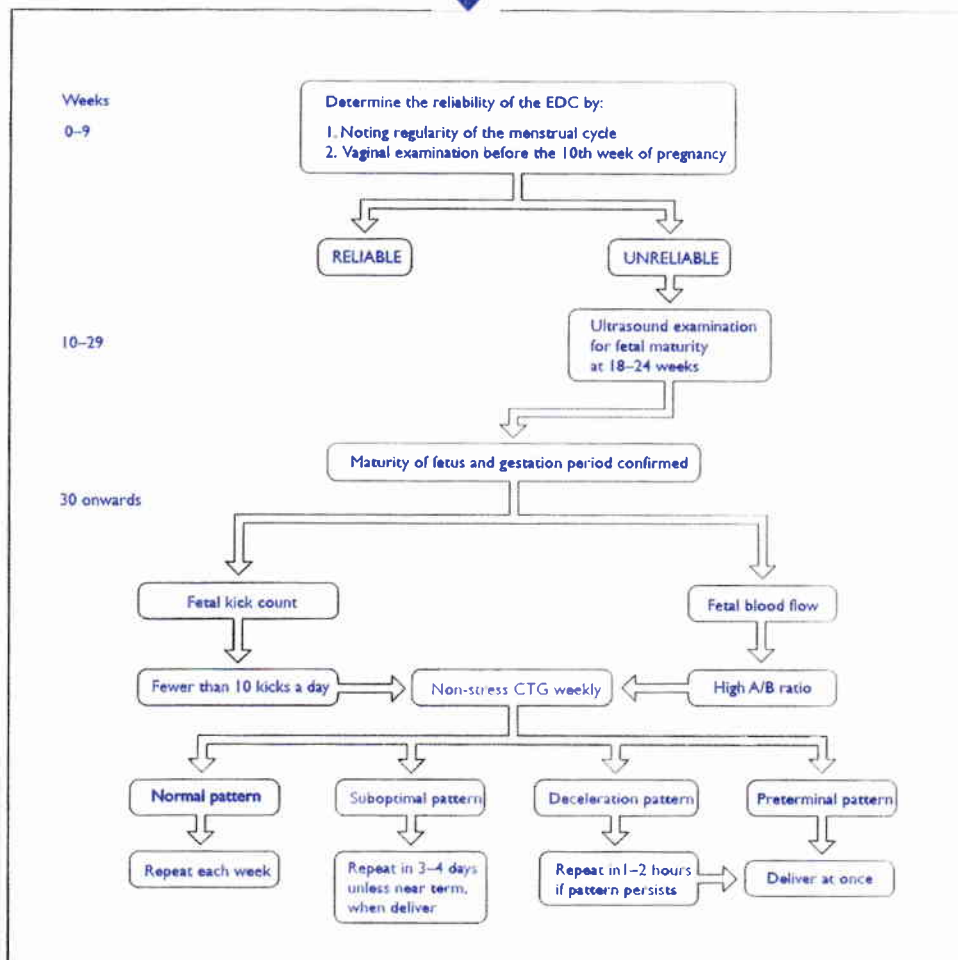
○ **Results**

- . *Negative* → contractions adequate + no *late* decelerations
- . *Positive* → contractions adequate + *late* decelerations in >50% of cont.
- . *Suspicious* → contractions adequate + *late* decelerations in < 50%
- . *Unsatisfactory* → failure to bring adequate contractions

NB ♦ There is high false -ve ∴ → these tests must be repeated (every 3d – 1wk)

- ♦ There is high false +ve ∴ → don't panic: sleep or do BPP, Doppler, AFI
- ♦ False -ve & false +ve are less in CST than NST

Pregnancies at high risk for uteroplacental insufficiency		
• hypertensive disease	diabetes	Rh immunization
• renal disease	anemia	antepartum hemorrhage
• cardiovascular disease	post-term pregnancy	advanced maternal age
• collagen vascular disease	multiple pregnancy	IUGR



Assessment of amniotic fluid by U/S

Qualitative	Quantitative (more accurate)
.Average	.Single pocket of liquor > 2 cm
.Below average	.Amniotic fluid index (AFI)
.Above average	

INTERPRETATIONS ⚡

① CARDIOTOCHOGRAPHY (CTG) Meyer Mink scoring system

	0	1	2
FHR	<100	100 – 120	120–160
Amplitude	< 5	5 – 15	15–20 beat
Frequency	< 2	2 – 4	4–5 cycles / min
Acceleration	–ve	1	2 / 20 min
Deceleration	type II in > 50%	II in < 50%	–ve

Score → (Normal → 8-10.....prepathogenic → 6-7.....path→ < 6)

② BIOPHYSICAL PROFILE (BPP) Manning score (30 min)

	0	2
CTG	< 2	> 2 acceleration / 20 min
Fetal breathing	Less	Continuous breathing for 30 sec
Fetal trunk mov	Less	At least 3 mov / 30 min
Fetal tone	–ve	Once opening or closing hand
AFV	<2x2cm	At least <i>single</i> pocket 2x2 cm

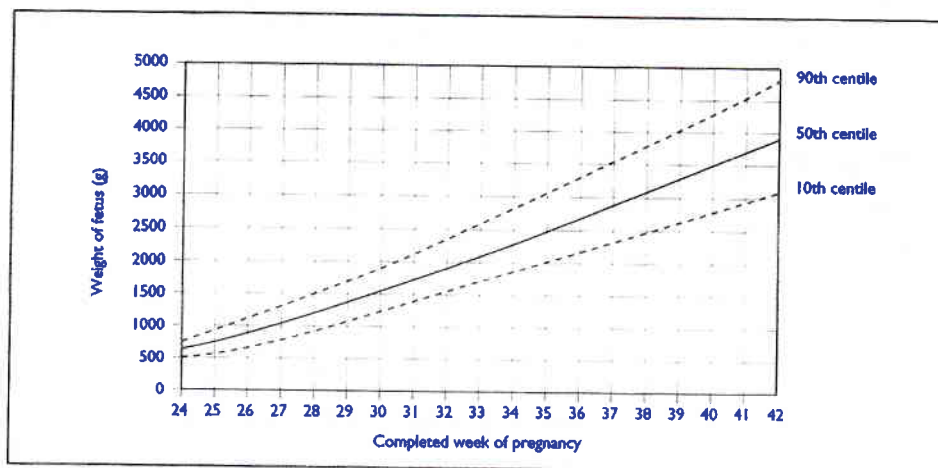
③ MODIFIED BPP (MBPP)

- Same parameters except CTG ⇒ less time consuming
- Some do only (NST + AFV)why?
 - NST → acute fetal hypoxia
 - AFV → chronic fetal hypoxia [■]

(**AFI** –amniotic fluid index– is the sum of the longest diameters of the 4 quadrants of the uterus (most imp in P^{ost}TL) → **N: 5–20**)

☠ High risk pregnancy ☠

- ▶ Doppler ⇒ for early detection
- ▶ CTG ⇒ . 8/10 → repeated weekly
 - . 5/10 → TOP
 - . 6–7 → mature: TOP
 - . immature: give corticosteroids → BPP
 - . Good → repeated twice weekly (esp if adequate AF)
 - . 6 → repeated daily
 - . ≤ 6 → TOP



Fetal weight at various weeks of gestation (from 24 weeks) among Scandinavian women as determined by ultrasound.



① IUGR 5 – 10 %



Definition

- * **IUGR** means pathological restriction in the ability to grow.....
 ↳ with birth weight < 10th percentile
- * **Pl. insufficiency** means ↓ of nutritive & resp function of the placenta
 ↳ due to **maternal** or **placental** causes

Etiology

..... **idiopathic (constitutional)** in 75% cases [□]ΦΦ

Maternal (15-20%)	Fetal (10%)	Placental
All HRP .PET ✓✓✓ .DM (vasculopathy) .RHD (class III or IV) Severe malnutrition Alcohol / Smoking	- Chromosomal e.g. trisomy - CFMF e.g. anencephaly - Teratogen exposure - Infection (STORCHEB) - Multiple pregnancy (TTTT)	* Placenta previa * Placental anomalies * Cord anomalies - True knot of the cord - Single umbilical artery - Velamentous insertion

Diagnosis

► History

- Previous history of IUGR
- Presence of an etiologic factor

► Examination

- **General** ⇔ underweight (<50kg) with failure to gain weight (esp >28wk)
- **Local** ⇔ fundal level < period of amenorrhea ± oligohydramnios ✓✓

► Investigations

1) **Ultrasound:** IUGR is considered when there is:

- . Difference between EGA & U/S > 2 wks
- . Delay in serial U/S measurements by > 2 wks

	Symmetrical (type I)	Asymmetrical (type II)
Patterns Of growth	All structures grow with same proportion but with a slower rate	unequal growth of different fetal structures with brain-sparing effect
Etiology	Fetal causes	Maternal (placental insufficiency)
Time	Early onset	Late in pregnancy
Prognosis	POOR. → mental / developmental	GOOD. → catch-up phenomena

2) **FWB** e.g. Doppler ✓ & BPP

3) **For the cause** e.g. GTT, STORCH screening

Treatment of intrapartum ----acute---- fetal distress ^α

1. *Change maternal position to her side* → relieves cord compression & ↑ placental blood flow
2. *Stop oxytocin immediately* → may give β_2 agonist
3. *Administration of*
 - Oxygen (to correct fetal hypoxia) ✓
 - IV fluids (to correct maternal hypotension) ✓
4. *If distress is persistent*
 - Immediate CS
 - Low forceps (if full cx dilatation)
5. *Proper neonatal resuscitation*

Complications

- ▶ **Antepartum** ⇔ Stillbirth
- ▶ **Intrapartum** ⇔ Perinatal asphyxia & acidosis
 - Meconium aspiration syndrome (MAS)
 - Hypoxic ischemic encephalopathy (HIE)
- ▶ **Postpartum** ⇔ Metabolic complications
 - Hypoglycemia (↓ glycogen stores in liver)
 - Hypocalcemia (functional hypoparathyroidism)
 - Hypothermia (↓ SC fat + hypoglycemia)
 - Polycythemia (chronic hypoxemia) → hyperbilirubinemia

Treatment

[1] **Prophylaxis** ⇔ baby aspirin (75mg) → improves placental circulation

[2] In Pregnancy

1st exclude symmetrical IUGR incompatible with life (e.g. lethal CFMF)

↪ **Hospitalization** ⇔ bed rest in lateral position ⇔ ↑ uteroplacental flow

↪ **Treatment of the cause**.....

↪ **Empirical therapy**

- *Aspirin*.....daily aspocid
- *Heparin*.....5000 units SC /12 hrs (prophylactic dose)
- *Corticosteroids*...enhance fetal lung maturity
- *Antioxidants & vit. E*.....recently

↪ **Follow up of**

★ **Growth** ⇔ by serial U/S every 1-2 weeks (also for AFI)

★ **FWB** ⇔

- Daily → Cardiff count to 10 kick chart
- Twice weekly → CTG } If non reassuring
- Once weekly → Doppler } results → BPP

★ **Lung maturity** ⇔ amniocentesis

Termination when

- Disease ⇔ CTG or BPP is pathologic
- Fetus ⇔ lung is mature
- Mother ⇔ complications occur e.g. severe oligohydramnios

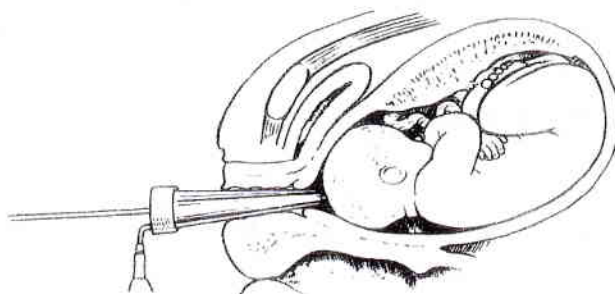
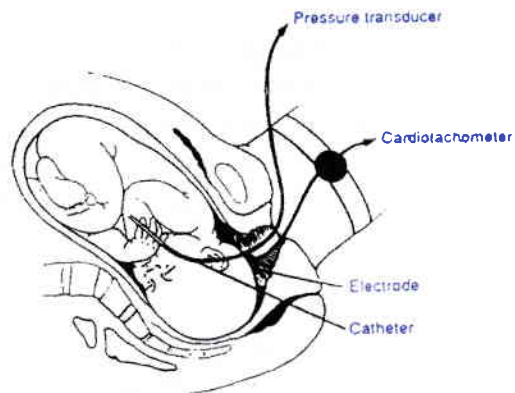
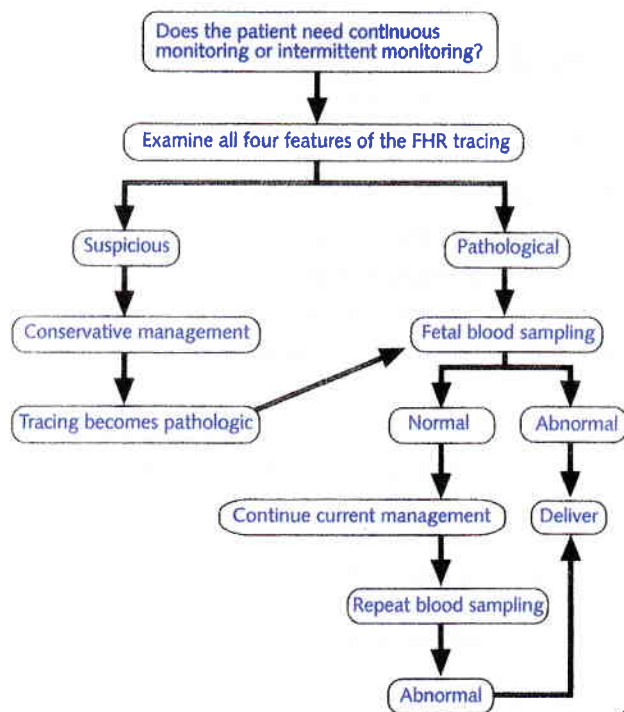
[3] In labor

* Continuous fetal monitoring → intrapartum CTG

* If fetal distress (expected✓...placental insuff. + oligamnios) → CS

[4] Neonate ⇔ expert neonatologist (as in preterm)

Algorithm for FHR monitoring.



To obtain a sample of fetal blood for pH estimation, a special tube (amnioscope) is passed through the cervix which must be sufficiently dilated.

Intrapartum assessment of FWB

① Clinical

- ❑ **Intermittent auscultation (Pinard stethoscope)**
 - Widely used *although not so accurate*
 - Immediately heard *after uterine contractions for 30 seconds*
 - Repeated every 30 minutes (1st stage) then every 5 min (2nd stage)
- ❑ **Amniotic fluid assessment**
 - Meconium staining is d.t. fetal hypoxia → CNS affection →
 ↑ intestinal motility & relaxation of sphincters
 - This may be normal in → breech, postdate

② Electronic

- ❑ **External monitoring**

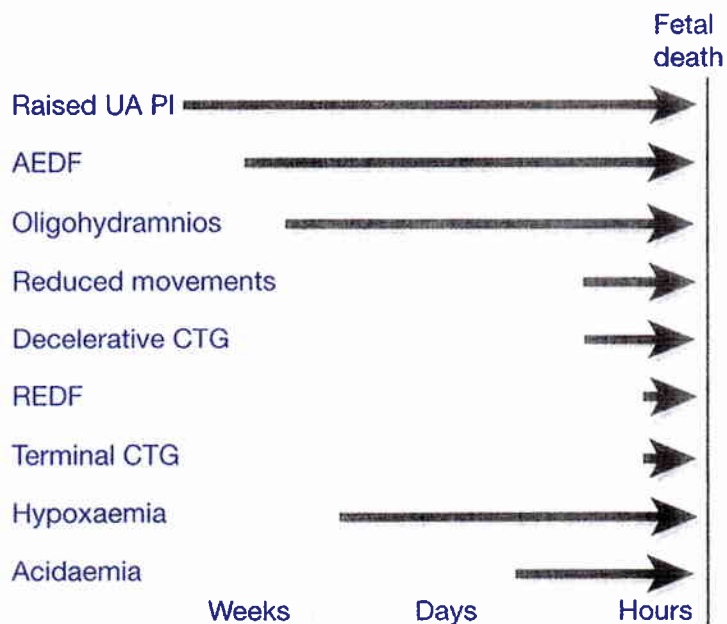
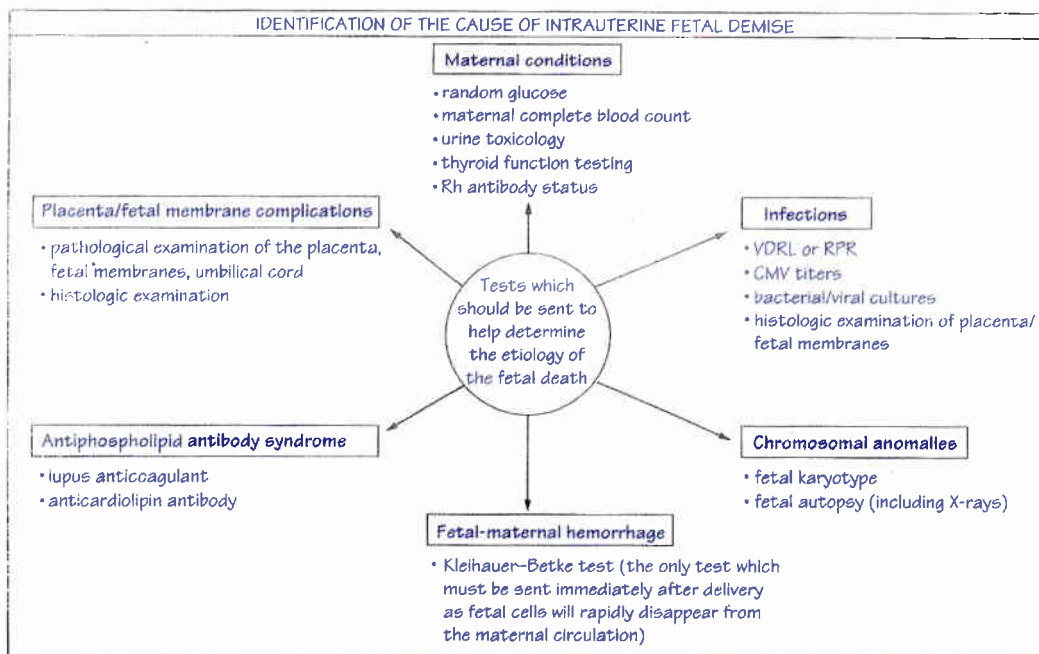
Both uterine contractions & FHR are recorded by an external transducer ⇔ tocodynamometer (fixed to the anterior abdominal wall by a belt) on a tracing paper
- ❑ **Internal monitoring**

Data are transmitted from

 - a. Intra-uterine transducer (for uterine contractions)
 - b. An electrode fixed to the scalp (for FHR)
 - ▶ **Requirements** → cx dilatation, ROM, cephalic presentation
 - ▶ **Advantages** → more accurate > external (esp for 'BTB' variability)
 - ▶ **Disadvantages** → fetal infection & trauma

③ Biochemical

- ❑ **Fetal scalp pH**
 - ▶ **Indication** → abnormal FHR by CTG (acute fetal distress[□])
 - ▶ **Method**
 - Cx is dilated enough (3-4cm) + ROM + well engaged head
 - Incise 3 – 5 mm through the amnioscope
 - Collect blood in a heparinized capillary tube
 - NB..... maternal ph should be done (it affects fetal ph[□])
 - ▶ **Results**
 - > 7.25 → normal
 - 7.2 – 7.25 → borderline → repeat^{□ □}
 - < 7.2 → acidosis → interfere → immediate CS
- ❑ **Fetal pulse oximetry**...placed against fetal scalp (50% sensitive)



The 'decompensation cascade' of fetal growth restriction. Absent end-diastolic flow (AEDF) is a relatively early sign of hypoxaemia, with reduced fetal movements, cardiotocographic abnormalities and reversed end-diastolic flow (REDF) late features. UA PI, umbilical artery pulsatility index.

Fetal death

① Antenatal fetal death (IUFD)

- ▶ **Etiology** ⇔ as in **IUGR** ☐☐
- ▶ **C/P** ⇔ as in **missed abortion**
- ▶ **Investigation**
 - U/S.....no FHS / no movement
 - β-HCG.....becomes -ve within two wks [Ⓜ]
 - X-ray.....
 - * **Ball's** sign (over-flexion d.t. loss of tone)
 - * **Over-riding** of ribs
 - * **Robert's** sign (appears after 48 hr- the earliest sign)
 - * **Spalding's** sign (appears after 1 wk)
- ▶ **Management**
 - **Prophylaxis** ⇔ antepartum fetal assessment as in **FWB**
 - **Expectant** ⇔ spontaneous delivery will occur n 2-3 wks
 - * but coag. profile should be repeated weekly
 - * prophylactic heparin may be given
 - **Active** ✓✓ ⇔ as in **TOP**
 - **Postnatal** ⇔
 - * Emotional support for the parents
 - * Search for a cause (karyotyping, postmortem picture)
 - * Counseling for future pregnancy (to avoid recurrence)

② **Intranatal death** (fresh stillbirth[Ⓜ]) as IUFD (+ fetal asphyxia, hge., inf., trauma)

③ **Neonatal death** same causes as all of above (PTL = 50% of causes [Ⓜ])

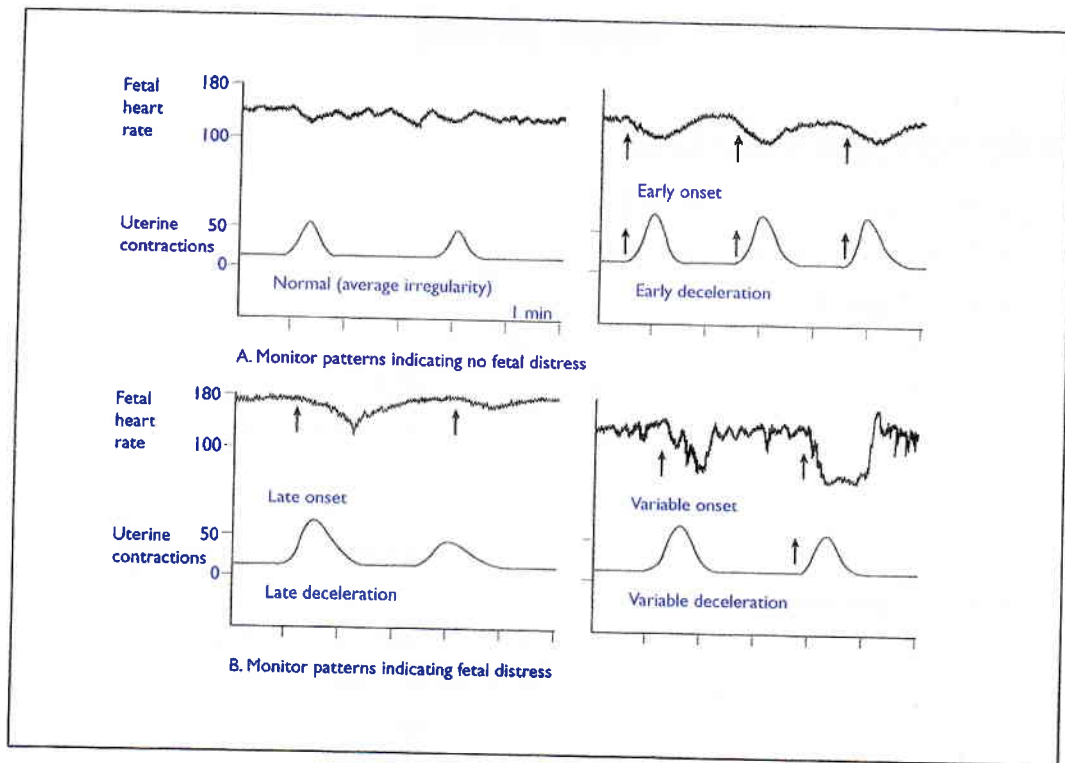
☠ PNMR includes ☠

1. Stillbirths = delivery of a dead fetus > 20 wks (either antenatal or intranatal)
2. Neonatal death = death of neonate in the 1st 4 wks following delivery [Ⓜ]

♣ **Stillbirth rate** =
$$\frac{\text{number of still births in one year}}{\text{number of total births in the same year}} \times 1000$$

♣ **Neonatal mortality rate** =
$$\frac{\text{number of neonatal death in one year}}{\text{number of live births in the same year}} \times 1000$$

♣ **PNMR** [Ⓜ] =
$$\frac{\text{number of stillbirths + neonatal deaths in one year}}{\text{number of total births } \text{Ⓜ} \text{ in the same year}} \times 1000$$



Abnormal fetal heart patterns in labour. (Arrows indicate the time of commencement of the uterine contraction.)

FETAL DISTRESS

ΦΦΦ

(asphyxia)

► **Etiology**

- **Antenatal distress** (as in antenatal fetal death)
- **Intrauterine distress** (as in intrapartum fetal death)

► **Management**

- **Prophylaxis** ⇨ intrapartum fetal assessment as in **FWB**
- **Active** ⇨ as in **TOP**

NEONATAL DISTRESS

(asphyxia neonatorum)

► **Etiology**

1. Persistence of intrauterine fetal distress after birth (esp. PTL ✓)
2. Respiratory depression; due to:-
 - Central → ICHge, drugs (morphine & anesthesia)
 - Air way obstruction → mucus, blood, meconium
 - Respiratory muscle weakness → congenital, prematurity
 - Alveoli → RDS

► **Types**
(imp.)

	Asphyxia Livida	Asphyxia Pallida
Etiology	Respiratory c. affection	VMC center is also affected
Color	Blue (blue asphyxia)	Pale (white asphyxia)
Pulse	No shock (slow & strong)	Shock (rapid & weak)
Eyes	½ opened, congested conj Normal reactive pupils	Closed, pale conjunctiva Dilated fixed pupils
Tone, reflex	Present	Absent
Prognosis	Good	Bad

► **Diagnosis** ⇨ APGAR score► **Treatment**

1. **Airway** ⇨ suction by a mucus catheter or a suction pump
2. **Breathing** ⇨ ambu bag....endotracheal tube (IPPV) → 95% O₂
3. **Cardiac resuscitation** ⇨ cardiac massage
4. **Drugs**
 - *Antibiotics* → guard against infection
 - *Naloxone* → 0.1 mg/kg (for pethidine given 2 hr < delivery) ± *surfactant*
 - *Epinephrine* → may be injected direct into the heart ± *volume expanders*
 - *Na bicarb* → to correct acidosis

Fetal Macroomia

Definition → Birth weight > 90th percentile for gestational age (LGA)
Or > 4.5 Kg (> 4 Kg in DM, why?)

Incidence → 5 – 10 % (50% due to DM)

Etiology **DOPE** ΦΦ

Generalized	Localized
- DM - Maternal Obesity - Postterm.....ϵ. fetalis - Familial.....constitutional	- Hydrocephalus.....Encephalocele - Meningocele.....Meningo-encephalocele - Cystic hygroma.....congenital goiter - Hydrothorax...Ascites...Sacrococcygeal tr

Diagnosis

► History

- . Previous history of macrosomic baby
- . Presence of an etiologic factor → DM

► Examination

- Excessive maternal weight gain
- Fundal level & umbilical grip

► Ultrasound

- Formulas depend on different fetal biometry measurement
- NB → . A large margin of error exists
 - . Abdominal circumference ✓ is the most reliable
 - . Recently → cheek to cheek dimension

Complications

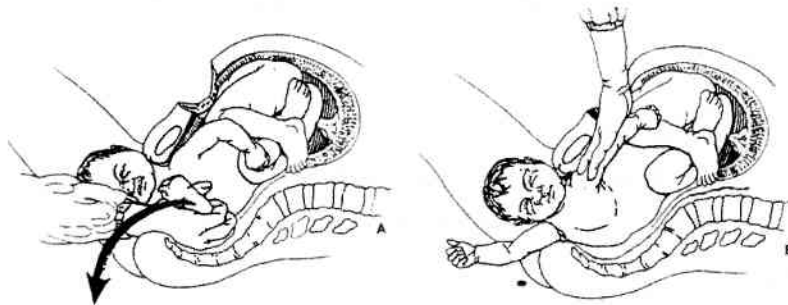
* Labor:

- *Obstructed* → TRAUMATIC DELIVERY → ↑ % of instrumental delivery & CS
 SHOULDER DYSTOCIA ✓✓
- *PPHge* → traumatic + atonic due to overdistension

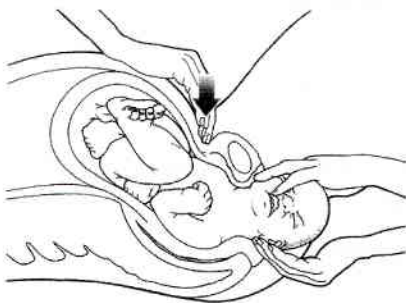
* Fetus (5).....

Managementmainly Prophylactic.....

- Elective CS if
 - 4.5 kg or > 4 kg in diabetics (strict control)
 - Macrosomic breech
 - Past HISTORY of shoulder dystocia or Erb's palsy



Bringing down ! post. arm.



Moderate suprapubic pressure is often the only additional maneuver necessary to free the anterior fetal shoulder.



Sharp ventral rotation of both maternal hips (McRoberts maneuver) brings the pelvic inlet and outlet into a more vertical alignment, facilitating delivery of the fetal shoulders.

Shoulder dystocia

Definition

- Impaction of the fetal shoulders (12 cm) after delivery of the head
- Suspected by . Prolonged 1st & 2nd stage
 - . TURTLE sign (the fetal chin is stuck against the perineum)

Etiology ⇔ FETAL MACROSOMIA ✓ & ANENCEPHALY

Incidence (0.5 – 1.5) is increased 11 times in > 4.0 kg
22 times in > 4.5 kg

Complications Φ

Fetal (mainly)	Maternal
- Asphyxia & death	- Obstructed delivery
- Injury of brachial plexus → Erb's palsy	- Traumatic delivery
- Fracture of clavicle or humerus	- PPHge

Management

- ✓ *Proper anticipation*....if there is no experience → better to perform CS
- ✓ *If occurred*.....emergency: GEA, operative theatre, expert senior team

①st LINE

- *Generous episiotomy*.....up to a 4th degree
- *McRoberts maneuver* (exaggerated lithotomy position).....
Both thighs are hyperflexed towards maternal abdomen while maintaining head traction. This leads to backward movement of the symphysis pubis → increase the anteroposterior diameter of the outlet
- *Suprapubic pressure*.....not fundal pressure

②nd LINE

- *Bringing down*the posterior arm...flex it, then sweep it across fetal chest
- *Rotation of the trunk* 180° to bring the anterior arm posteriorly (Woods CORKSCREW ACTION)....to benefit from the pelvic obliquity, also the hollow sacrum allows better manipulations posteriorly

③rd LINE

- *Cleidectomy*.....*Fracturing the clavicle*.....*Symphysiotomy*
- *Zavanelli maneuver* (the fetal head is forced backwards followed by CS) ..?!



②

PTL

(5-10 %)



Definition

- ◆ Labor starting < the completion of 37 wks (259 d) and > 28 wks
- ◆ Labor = active uterine contractions leading to progressive cervical changes
- ◆ LBW < 2.5 kg.....very LBW < 1.5 kg.....extreme LBW < 1 kg

Etiology

ΦΦΦ

- ⇒ Induced (iatrogenic) ⇔ when continuation of preg. is hazardous (on M or F)
- ⇒ Spontaneous ⇔ idiopathic in 30% of cases

1) Fetal

- PREVIOUS PTL (30%) or INDUCED ABORTION ✓ ①
- Multiple pregnancy ✓ / CFMF / Rh isoimmunization

2) Local

- Infections → chorioamnionitis, esp. subclinical ②
- AF → PROM, Polyhydramnios..... ③
- Placenta → placental insufficiency, p.previa / abruptio pl.
- Uterus → CMF of uterus, fibroid, patulous internal os

3) Systemic (as in MGR)

- HRP.....e.g.....DM, hypertensive, cardiac, UTI
- Malnutrition.....Smoking & alcohol
- Extremes of age....no relation to parity ▢

Complications

.....responsible for **50% of PNMR** other than CFMF.....

① Early

- 1) Hge → ICHge (↓ prothrombin, fragile vessels, soft bones)
- 2) Resp. → asphyxia (due to RDS, atelectasis)
- 3) Infections → pneumonia (lowered immunity)
- 4) Anemia ↓ Iron stores (Fe is stored in fetal liver in last months of preg)
- 5) Jaundice → exaggerated physiological J. (immature liver enzymes)

② Late

- 1) Malnutrition (weak suckling + poor stores) → rickets
- 2) Mental retardation & CP is more common
- 3) Retrolental fibroplasia if given pure O₂ for long time

③ Features of a premature baby

- Weight → < 2.5 kg Height → < 45 cm Head → relatively large
- Skin → thin, red, wrinkled (no S.C. fat), short fingernails, lanugo hair
- Decreased vitality → drowsy, weak cry, weak suckling, hypothermia

Treatment

① Prophylaxis (e.g. for polyhydramnios, twins)

- **Good ANC with early detection of any cause**
- **ReStSedatives.....No S.intercourse**
- **Screening (Serial measurement of)**
 - *Cervical dimensions by TVUS ✓✓✓²*
 - *Cervico-vaginal swab for early detection of infection*
 - *Cx-vag fibronectin* (cellular glycoprotein acting as a tissue glue) (N: 50 ng/ml)
- **Medications**
 - *Tocolytic agents.....no proven benefit*
 - *Progesterone.....Depot provera 150 mg IM / wk*
 - *Prophylactic cerclage...very difficult → ROM*

② Doubtful (threatened) PTL

- ▶ Confuses with MG (common) complainig of
 - False labor pain (vague lower abdominal pain or backache)
 - Change of the ccc of the vaginal discharge
- ▶ Lines....Hospitalization to assess
 - Presence of active cont. (digital palpation OR electronic monitor)
 - Cervical condition (depends on BISHOP score)
 - Fetal condition (CTG OR BPP)

③ Established PTL

- ▶ **Diagnosis** . Progressive uterine contractions (6–8 /hr OR 4 /20 min)
 - . Progressive cx changes: - dilatation > 2 cm
 - effacement > 80% (cx < 0.5 cm)
- ▶ **Lines**
 - Hospitalization ⇔ rest + good hydration (500 ml over 20 min)
 - ✓ **Antibiotics** ⇔ prophylaxis against (e.g. *erythromycin* for GBS)
 - ✓ **Corticosteroids** ⇔ enhance fetal lung maturity ~~~
 - ✓ **Tocolytic drugs** ⇔ if no contraindication to continue preg ~~~

④ Management if delivery occurred

- ▶ **1st stage**
 - Prophylactic antibiotics (2g ampicillin / 6 hrs)
 - Vit K 10 mg IM to mother (& 1 mg to fetus after delivery)
- ▶ **2nd stage**
 - Episiotomy ± forceps (↓ compression of head)
 - CS if → premature breech, associated IUGR, other indications
- ▶ **Preterm newborn**
 - *Airway* → suction + O₂ (avoid 100%)
 - *Temp* → avoid hypothermia
 - *Feeding* → avoid hypoglycemia (best is mother milk)

(Enhancement of fetal lung maturity 🐾)

🐾 Assessment of maturity Φ

✧ History → EDD:

- The patient is sure of her dates
- At least previous 3 regular cycles
- No COC for the last 3 months < pregnancy

✧ Clinical → Fundal *level* corresponding to period of amenorrhea

✧ Investigations

- U/S - Amniotic fluid turbidity
 - Placental calcification grade III
- Amniocentesis
 - L/S ratio > 2 / Phosphatidyl glycerol (esp for DM)
 - Bubble stability test (shake test)
 - Nile blue sulfate test
 - Creatinine concentration > 2 mg%

🐾 Mechanism of maturity

- * Surfactants (6 types) are secreted by type II alveolar pneumocytes under the control of fetal adrenal cortical activity
- * Surfactant is composed of phospho-lipid.....protein....cholesterol
 - Phosphatidyl-choline: Lecithin (75%) ✓
 - Phosphatidyl-glycerol (the 2nd commonest)
- * *Function of surfactant*
 - ↓ surface tension or stickiness of alveolar walls
 - Helps expansion of the alveoli during *inspiration*
 - Prevents their collapse during *expiration*

🐾 Pharmacological enhancement of maturity by steroids

- ✧ Indications (all HRP....any condition which may → fetal distress??)
- ✧ Action → enhance fetal release of surfactant
- ✧ Advantages → ↓ PNMR.....RDS.....ICHge.....NEC
- ✧ Contraindications (relative)
 - DM & hypertension → interfere with proper control
 - PROM & RHD → risk of infection
- ✧ Dose
 - **Betamethasone** → 12 mg twice 24 hours apart
 - **Dexamethasone** → 6 mg / 12 hour for 4 doses
- ✧ Route (IM better than IV)
- ✧ Duration → from 28.....34 weeks (not before or after, why?)
- ✧ Methods . **Multiple** (repeated weekly) as steroids act for 7 days
 - . **Single** → (recent) no benefit from repetition & to ↓ side effects

🦋 SOME IMPORTANT NOTES IN TOCOLYSIS

- ❑ **No improvement in neonatal outcome** has been confirmed by any tocolytic therapy
- ❑ **Ritodrine**, although universally used, still not approved by FDA (USA)
- ❑ **Combined agents** (dual agent tocolysis) may be used e.g.
 - Profenid + ritodrine
 - However.... Ca^{++} channel blockers may enhance MgSO_4 toxicity [▪]
- ❑ **Tocolysis in special groups**
 - Avoid yutopar in → Twins, cardiac, DM
 - Avoid yutopar with corticosteroids → pulmonary edema
 - Avoid MgSO_4 in → renal diseases
 - Avoid MgSO_4 with fluid overload → pulmonary edema
- ❑ **Recent Tocolytics**
 - Nitric oxide donors → nitroglycerine patches (10 mg)
 - Oxytocin antagonists → Atosiban
 - Progesterone → DMPA / week 150 mg
 - NB: Ethanol was the 1st tocolytic used (drunken & acidosis!!)

Tocolytic Agents

□ There are 2 approaches to inhibit labor

1. Long term maintenance tocolysis (no role although very widely used)
2. Short term (the only advantage of tocolytics is to delay labor for 48 – 72 hrs till effect of steroids act or till in-utero transfer to a 3rd center)

□ Contraindications

- Mother → if prolongation of labor is contraindicated → severe PET
- Fetus → if fetus is compromised → fetal distress, IUGR, CFMF
- Disease → If labor is advanced → cx > 3-4 cm, fully effaced, PROM

1] β_2 sympathomimetics

Ritodrine.....most used, most effective

* **Mech. of action** → stimulates β_2 receptors → inhibit ut. contractions

* **Side effects** (sympathetic effects d.t. β_1 affection with high doses)

- Maternal

- . Palpitation, ischemia, flushing, headache, tremors
- . Hyperglycemia & hyperinsulinemia in DM → hypo- k^+ & acidosis
- . Pulmonary edema (esp if + steroids, twins, heart disease, PET)

- Fetal

- . Tachycardia, arrhythmias, decreased B₂B variability
- . Hypoglycemia, hypokalemia, hypocalcemia, hyperbilirubinemia

* **Contraindications**

↘ heart disease / hypertension / thyrotoxicosis / uncontrolled DM

* **Doses**

- ▶ Ritodrine Hcl (yutopar) ampoule is 5ml (50 mg) by titration short of toxicity
- ▶ Terbutaline (bricanyl) could be given SC (max 5 mg/ day)

2] PG synthetase inhibitors (antiprostaglandins)

* **Drugs** → Ketoprofen (profenid) / Indomethacin (indocid)

* **Dose** → orally (25 mg 1x4) or rectally (100 mg 1x2)

* **Side effects:** *Mother:* stomach irritation & ulcers

Fetus: - Premature closure of ductus arteriosus

- Oligoamnios (↓urine formation by fetal kidney)

3] Mg sulfateas in PET $\approx \approx$ loading 6...maintenance 2

4] Ca^{++} channel blockers ✓✓

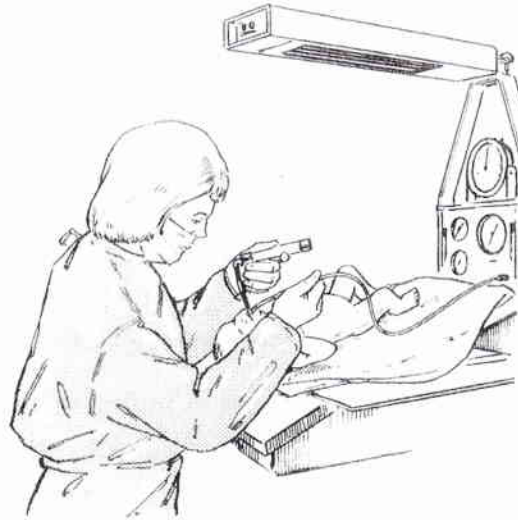
* **Drug** → nifedipine (adalat)

* **Advantage** → same efficiency as yutopar & more safe (esp on fetus)

* **Dose** → 10 mg orally/ 20 min for 4 doses.....maintenance / 6 hrs

* **Side effects** → hypotension, tachycardia, facial flushing, headache

APNOEA — RESUSCITATION



All mucus, blood and meconium must be sucked out before the baby has a chance to inhale them. A disposable mucus extractor can be used as shown.



Types of meconium ♡♡

	Thin meconium	Thick meconium
Color	slightly green-stained AF	thick, green-stained AF
Consistency	Small amount of meconium	Larger amounts
Significance	No particulate matter not ttt	Serious condition

Respiratory Distress Syndrome (HMD)



► Etiology

- PTL, DM, infants delivered by C.S.
- The true cause is unknown but it m.b.d.t. ↓ lung surfactant

► Types

- . Type I.....Hyaline Membrane Disease (HMD)
- . Type II.....Transient Tachypnea of Newborn (TTN)

► Pathology

- Alveoli are collapsed (atelectic)....alveolar ducts are overdistended
- They are lined by a hyaline membrane (structureless eosinophilic memb. formed of fibrin, most probably a capillary transudate)

► Investigations ⇌ chest x- ray

1. Lung collapse, ↑ vascular markings
2. Air bronchogram (↑ bronchial air shadows)
3. Bilateral diffuse granular opacities (ground glass appearance)

► Complications

- * Respiratory ⇌ spontaneous pneumothorax, interstitial emphysema
- * Non respiratory ⇌
 - ICHge.....cerebral edema.....convulsions.....CP.....MR
 - Heart failure.....patent ductus arteriosus
 - Necrotizing enterocolitis.....acid base imbalance

► Treatment

- Prophylaxis ⇌ assess fetal lung maturity ± acceleration by steroids
- Active.....ABCD

.....Meconium aspiration syndrome.....

► **Definition** ⇌ meconium consists of sloughed intest. epithelial cells, GIT secretions, swallowed debris (hair, vernix, skin cells)

► **Pathophysiology** ⇌ fetal distress → disturbance of CNS control on GIT

↳ hypermobility + relaxation of sphincters

↳ ↑ meconium in AF → if aspirated at delivery:-

- 1- Chemical pneumonitis, airway occlusion
- 2- Persistent pulmonary hypertension

► **DD** ⇌ Breech, oligohydramnios, postmaturity

► **Prevention** - Nasopharyngeal suction < the 1st breath

- Endotracheal aspiration immediately after birth

Definition ⇒ prolongation of pregnancy beyond 42nd week

If + $\Rightarrow$ placental insufficiency & IUGR (= dysmaturity syndrome)

Etiology unknown → may occur d.t.

- Wrong dates (the commonest) ✓
- Familial tendency (genetic ?)
- Non-engagement (malpresentation & CPD)
- Anencephaly (no corticosteroid synthesis by fetus)
- Prolonged anti-PG therapy

Diagnosis

- 1. History** ⇒ determine the accurate LMP (1st step⁺)
- 2. Clinical** ⇒ ↓ maternal weight & abdominal girth.....d.t. oligoamnios
↑ fetal size, easy felt
- 3. U/S** ⇒ biometry (BPD > 10.2).....Liquor (oligo & turbid).... placenta (Ca⁺⁺)

C/P of the newborn

- Weight → > 4 kg.....Height → 54 cm
- Head circumference increased with small anterior fontanelle
- Long scalp hair, nails beyond the finger tips
- Skin → ↓ SC fat, wrinkled, meconium stained

Comp.

Maternal	Fetal...5
1 st → uterine atony	1- Asphyxia
2 nd → obstructed (macrosomia)	. IHE (calcification...pl. insufficiency)
3 rd → PPHge	. MAS (oligamnios)
(atonic + instrumental + ↑ CS)	2 – Injury (macrosomia)
	3 – Infection (excess interference)

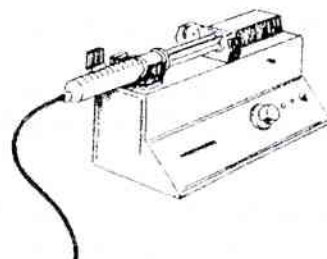
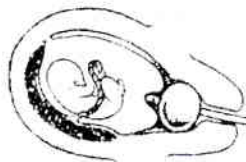
 $\Phi\Phi$

Management

- There is controversy on whether to conserve till 41 or 42 wks or to terminate once term is reached (as spontaneous smooth onset of labor is better than induction)
- **At 40 wks...** FWB tests are repeated twice weekly (CTG, BPP, Doppler)
- **At 41 wks...** * if cx is ripe → AROM + oxytocin
 * If cx is not ripe → wait another week (AFI is v. imp. in follow up)
- **At 42 wks...** # if cx is ripe → AROM + oxytocin
 # If cx not ripe → PGE₂ vaginal suppository → AROM + oxytocin
 # CS (↑ %) is done if → macrosomia, HRP, not fit or failed induction
- **At any time...** TOP is done if comp. occurred (e.g. fetal distress, oligoamnios)

White Knight Love

intrauterine
extramniotic
PG.



Abortion may be expected within
24 hours, and the uterus should then
be curetted under general anaesthesia.

② Prostaglandins

Synthesis



Actions

- *Cervix* $\Rightarrow$ ripening (PGE_2) $\therefore$ used in ripening of cx & initiation of labor
- *Uterus* $\Rightarrow$ contraction ($\text{PGF}_2\alpha$) $\therefore$ used in induction of abortion or labor
- *On fetus* $\Rightarrow$ keeps ductus arteriosus patent $\square$ & helps urine formation

Comp. & contraindications (as in oxytocin)

- Due to contraction of other smooth ms $\rightarrow$ diarrhea, bronchospasm, fever

Administration Very dangerous drugs, more potent than oxytocin
but less safe, therefore more used in earlier pregnancy

- *Vaginal tablets* ✓✓ $\square \square$
 - ❖ $\text{PGE}_1 \Rightarrow$ **Cytotec, mesotec**.....(mesopristone)
 - $\hookrightarrow$ Mainly used for induction of abortion, ttt of PPHge
 - $\hookrightarrow$ May be used for induction of labor (25 μg /4 hrs for 4 doses only)
 - ❖ $\text{PGE}_2 \Rightarrow$ **Prostein, vagiprost, cervidil**.....(dinoprostone)
 - $\hookrightarrow$ Mainly used for cervical ripening –dinoglandin $\square$ –
 - $\hookrightarrow$ More expensive....takes more time but.....less ut hyperstimulation
- *Intrauterine-extramniotic* ✗ $\rightarrow$ $\text{PGF}_2\alpha$ (Enzaprost) $\rightarrow$ induction of abortion
- *Intramyometrial* ✗ $\rightarrow$ $\text{PGF}_2\alpha$ in PPHge.

③ Ergot alkaloids

Actions

- Stimulates **tonic** uterine contractions (action lasts for 4 hours)
- Vasoconstriction in high doses

Uses.....ergometrine (methergine)..... a plant alkaloid

- *Abortion* as inevitable, incomplete, missed + Postabortive bleeding
- *3rd stage* of labor (only after delivery of fetus) + Atonic PPHge

Complications

- ▶ **If before fetus is delivered** $\rightarrow$ marked fetal distress up to asphyxia
- ▶ **In toxic doses** $\rightarrow$ hypertension or limb ischemia ($\therefore$ contraindicated in....)

Administration

	Dose	Action starts after
Oral	1 mg tablet	7 minutes
IM	0.25 – 0.5 mg	3.5 min
IV	0.25 mg	½ – 1 min



③ Premature rupture of membranes (PROM)



Definition

* **PROM** → rupture < onset of active uterine contractions (10 %)...Prelabor ROM

FATE: - It may be considered a *normal variant* of onset of labor

- Usually labor occurs within 24 hrs in 80 % of cases

* **Preterm PROM** → PROM prior to the completion of 37 weeks (1 %)

FATE: - May be followed by PTL in 1/3 of cases within few days

- Longer latency period is expected if it occurs at earlier G.age

- . *Normally* → membranes rupture during the active phase of labor ($\approx 3-4$ cm)
- . The latent period (LATENCY) is the time from ROM → onset of uterine contractions
- . HIGH LEAKS may occur d.t. tear above the LUS → usually seals spontaneously

Etiology 7 | ΦΦ

1. ✓ Infection

- GBS✓, CHLAMYDIA, MYCOPLASMA,
- Gonococcus, bacterial vaginosis, bacteroides, trichomonas

2. Intercourse in predisposed ladies by

- Introduction of infection
- PG in seminal fluid → contractions

3. Iatrogenic → cerclage, amniocentesis, ECV

4. Incompetent cervix

5. (Inflation) excessive stretch of the membranes

- Multiple pregnancy, polyhydramnios
- Unfit presenting part on cx → malpresentations, non-engagement

6. Inherent weakness of the membranes (↓ collagen) e.g.

7. Insufficient Nutrition as vit C, copper, zinc & smoking (↓ collagen)

Clinical Picture

1) Symptoms

- Sudden gush of watery fluid from vagina ①
- D.D. → urine, infection, show

2) Signs

- ▶ **General** → signs of infection may be present
- ▶ **Abd**
 - Fundal level.....< period of amenorrhea
 - Umbilical grip.....Fetal parts are felt more easily
 - If liquor is drained → uterus moulded over fetus
 - FHS.....heard easily (unless distressed)
- ▶ **Pelvic** → NOT done (risk of infection) EXCEPT if TOP will be done

► Sterile speculum (bed-side-test)

1. To confirm PROM ►

- Inspection.....AF is seen coming from cervix (diagnostic) ②
- Nitrazine paper.....alkaline (pH 7-7.5) turns from yellow to blue^a
- Nile blue sulfate.....detect fat containing cells X
- Fern test.....+ve (high NaCl in AF → arborization) X

2. To determine maturity ► L/S ratio, P.glycerol, shake (bubble) test

3. To take vaginal swab ► for C&S

Investigations

- **Comp. (inf)**ESR, TLC, CRP (non-specific acute phase reactants)
- **Diagnosis**► Ultrasound → ↓ amount of liquor ③
 - Amniocentesis → dye (amniography) ④ XX
 - ↳ pus cells, lung maturity, ↓ glucose
- **Fetal Wellbeing**poor BPP is an early predictor of infection

Complications

A) Maternal

1. PTL & its sequelae

- RDS, IVHge
- Cerebral palsy, necrotizing enterocolitis

2. Chorioamnionitis ✓✓

- Severe infection (esp GBS & E.coli)
- It may occur even without ROM (listeria monocytogenous)

	Symptom (3)	Sign (3)	Comp	Inv	TTT
Gen	Fever (≥ 37.8°C)	↑ P (>100), ↑ Temp. ↑ Resp. rate, ↓ UOP	- Endometritis - P. sepsis	TLC ESR CRP	- Atbics - Fluids
Abd	Abdominal pain ± PTL	Uterine tenderness Fetal tachyc. (1 st sign)	- Peritonitis - DIC - SIRS	Amni- ocents	- TOP: VD ✓ CS X
Vag	Offensive vaginal discharge				

B) Fetal (high PNMR)

1. Prolonged oligohydramnios✓

- Lung hypoplasia (esp if ROM < 26 wks or latency > 6 wks)
- Mech. effects → arthrogryposis, talipes equinovarus, amputations

2. Perinatal asphyxia

- Congenital & neonatal infections → pneumonia, septicemia
- Oligohydramnios (malpresentation, cord compression)

NBTreatment according to gestational age.....

	< 26	26 – 32	32 – 35 (36)	> 35 (36)
Problem is	too immature	RDS	Chorioamnion.	Nothing
Conservative	No	TTT of choice		No
Active	TOP	No (except if....)		TOP

Treatment

► Prophylaxis

- . Prophylactic cerclage for → incompetent cervix & uterine anomalies
- . Prophylactic tocolysis for → high risk groups for PTL (e.g. twins)

► Active

A- Conservative (Expectantⁿ)

Indications

- ❑ < 35 weeks (<26 wks is considered too early to conserve → comp.)
- ❑ Pulmonary immaturity
- ❑ No signs of infection
- ❑ No active labor pains

Measures

1. **Hospitalization** → bed rest with sterile dressing between thighs to detect AF (no PV✓)
2. **Follow up fetal well being**
 - * Enhance lung maturity by **corticosteroids**
 - ↳ (not preferred by some X → flare up infection)
3. **Follow up infection**
 - * Temperature follow up chart (every 4 hours)
 - * Every other day → TLC, ESR, CRP (early prediction of inf.)
 - * Prophylactic **antibiotics** (*Erythromycin* or *clindamycin*)
 - ↳ (not preferred by some X → mask infection)
4. **Follow up PTL**
 - * Prophylactic β_2 **sympathomimetics**
 - ↳ (not preferred by some X → PTL is a sequelae of occult infection)

.....Recently a single dose steroid + prophylactic atbc is only allowed.....

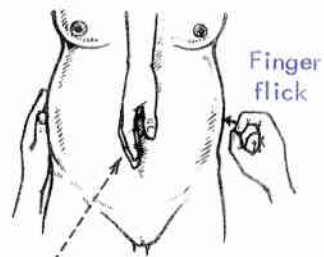
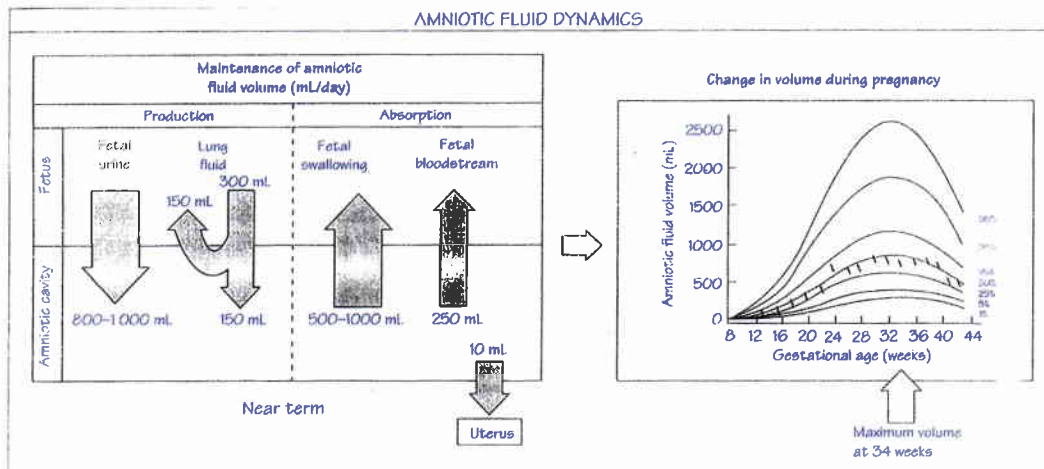
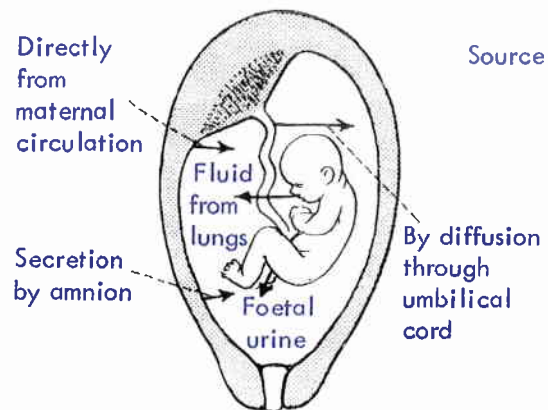
B- Termination

Indications

- ❑ >35 weeks (it is better to await 24 hrs for spont delivery)
- ❑ Lung maturity (known by history, clinically, investigations)
- ❑ Evidence of chorioamnionitis = presence of ≥ 2 criteria
- ❑ Active labor pains (PTL m.b. the only sign of chorioamnionitis)

Measures

- **Vaginal delivery** → if fit for induction (monitor + strong antibiotics)
- **C. section** → +if severe intrauterine infection & delivery is not soon



Hand on abdomen to cut transmission of impulse round abdominal wall



Polyhydramnios



Polyhydramnios

0.5-1.5%



Definition ↑ in amount of AF to a degree detected clinically
= (> 2 Liters; Amniotic Fluid Index > 20 cm)

Etiology idiopathic → in 2/3 of cases

1] FETAL (20%)

* **Twins** (binovular or uniovular) uni → acute hydramnios

* **CFMF** ⇒ Open NTD

- anencephaly[□] (no swallowing, no ADH, ↑ CSF)
- spina bifida

⇒ Interfere with swallowing:

- esophageal / duodenal atresia
- tracheo-esophageal fistula

⇒ Congenital nephrosis or liver cirrhosis or gastroschisis

* **Hydrops fetalis**

2] PLACENTAL – Chorioangioma of placenta

– Obstruction to circulation in cord as in knots

3] MATERNAL (15%) – Generalized anasarca as.....heart / renal failure

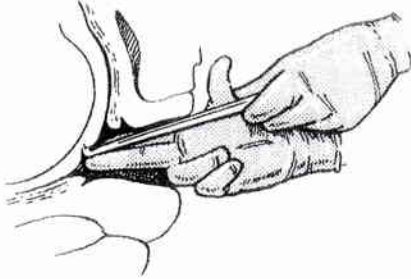
– Diabetes mellitus ✓ due to3 causes

Clinical picture

according to the **RATE** of accumulation of AF

	Acute x	Chronic ✓
Incidence	1 /2000	1 /200
Etiology	Usually uniovular twins	Any cause
Time	Early (4 – 6 months)	Late (> 28 wks)
Symptoms	- Rapidly progressive (few days) - N&V, Abdominal <u>pain</u> - Dyspnea / Palpitation	- Gradually progressive - Abdominal <u>discomfort</u> - less pressure symptoms
Signs	LL edema, ↑ weight gain, ± PET	
1. General		
2. Abd. (FL > amen)	- Abdomen markedly enlarged - Fetal parts <u>unfelt</u> - FHS not heard	- Very tense + stretched skin - <u>Difficult</u> to feel - <u>Difficult</u> to hear
3. P/V	Cervix is partially dilated with bulging membranes	

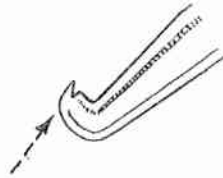
1. Forewater Amniotomy



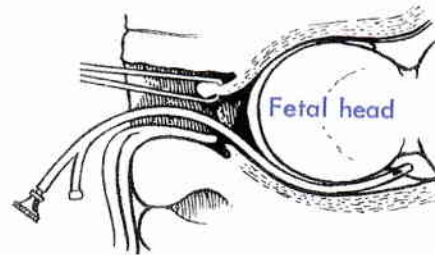
2. Hindwater Amniotomy



The instrument used is a Drew-Smythe cannula.



Amnihook.



Investigations

- Etiology.....e.g. - blood glucose level ✓
- U/S → twins, CFMF
- Diagnostic....AFI > 20 cm
- Tests for FWB....routine

D.Diagnosis ⇔ Fundal level > period of amenorrhea

Complications ΦΦ

Pregnancy	Labor	Fetal
* A bortion (acute & early cases)	<u>1st stage</u>	1. PTL
* P TL	- P rolonged (uterine inertia)	
* P ressure symptoms	- P ROM → cord prolapse, infection	2. CFMF
* P ET (25% of cases)	<u>2nd stage</u> → ob struction due to malpresentation	
* A PHge →	<u>3rd stage....S₃</u>	
- P. previa (large placenta)	- P Phge (atonic + retained placenta)	
- Abruptio placenta (if ROM with rapid drainage of liquor)	- P uerperal sepsis	
* Ma presentations & non-engagement of presenting part	- S ubinvolution	

Management**1) CONSERVATION**

- *Bed rest on side*
- *Treat cause / Symptomatic ttt / improve nutrition ✓✓*
- *Anti-PG.....↓ renal production of urine in fetus*
Oral → 25 mg 1x4 / Suppository → 100 mg 1x2
- *Amnioreduction....repeated amniocentesis (but it recollects)*
(not > 0.5 L /hr, not > 2 L /session)

2) TOP↳ **Indications**

- Failed conservative ttt (esp in ACUTE cases)
- Marked pressure symptoms (e.g. dyspnea, difficult ambulation)
- CFMF

↳ **Methods**

- Vaginal → AROM should be slow (to avoid abruptio placenta):-
* Controlled drainage of amniotic fluid
* Hindwater rupture with Drew Smythe catheter
- C.S → malpresentations, uterine inertia, guard against PPHge

History

Edith Louise Potter (1901-1993), from Iowa, described this syndrome. Importantly, she had the insight to realize that teratogenic syndromes involving apparently unrelated organs might result from the timing of a specific teratogenic influence.



Oligohydramnios 0.5-1.5%



Definition ↓ amount of AF detected clinically (usually < 0.5 L)

Etiology¹

1. PROM → the most common cause ✓ ✓
 - Placental insufficiency e.g. PET ✓ & DM.....IUGR.....Postmaturity
 - CFMF → Potter's syndrome² (bilateral renal agenesis ± facial abnormalities)
2. Idiopathic / Iatrogenic → prolonged use of anti-PG, after amniocentesis

Clinical picture

Symptoms → history of PROM, decreased fetal kicks

Signs **Abdominal** → * FL < period of amenorrhea
 * Fetal parts easily felt / FHS easy heard

PV → small bag of forewaters

Invest....U/S

- Diagnosis ⇔ no pocket of AF 2x2cm or AFI < 5cm
- Etiology ⇔ CFMF....postmaturity
- Test for FWB

Complications

1] Maternal.....↑ incidence of CS d.t.

- Prolonged labor (small bag of forewaters → slow cx dilatation)
- Perinatal asphyxia (↓ AF → cord compression)
- Prolonged oligohydramnios (pulmonary hypoplasia + mechanical effects)
- Breech is more common (↓ AF interferes with spont correction)

2] Fetal

- **Fetal anomalies** → CFMF
- **Fetal injury** → due to ↑ operative interference

Management

1] In pregnancy

- Malformed → TOP (AROM ± oxytocin)
- Not malformed → observe for fetal distress ± amnioinfusion:
 - Infusion of ⇔ warm saline into amniotic sac (guided by US)
 - Also for tt ⇔ chorioamnionitis (antibiotic) & MAS (dilution)
 - It may lead ⇔ infection, AF embolism, PTL (irritation), PROM

2] In labor.....↑ incidence of CS d.t...

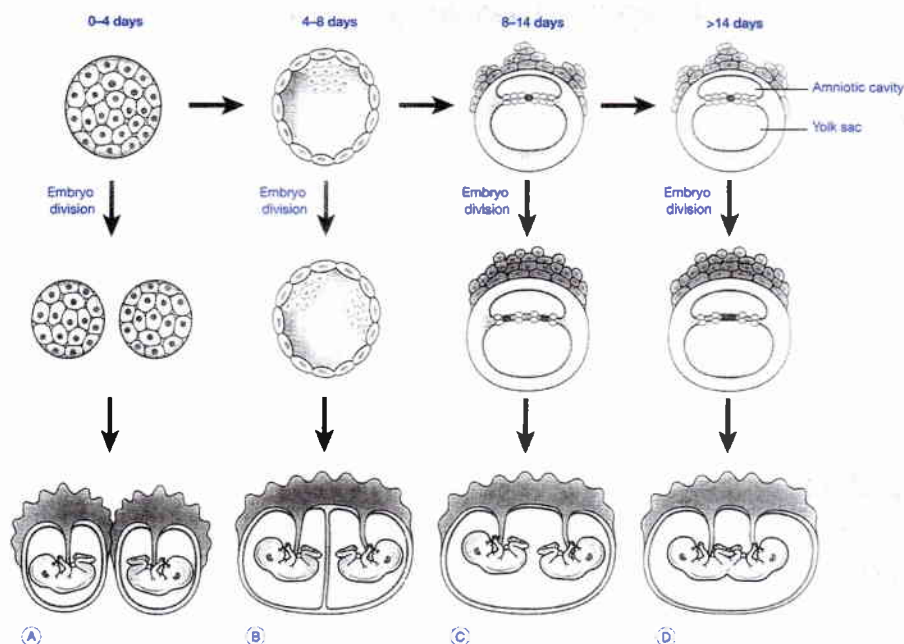
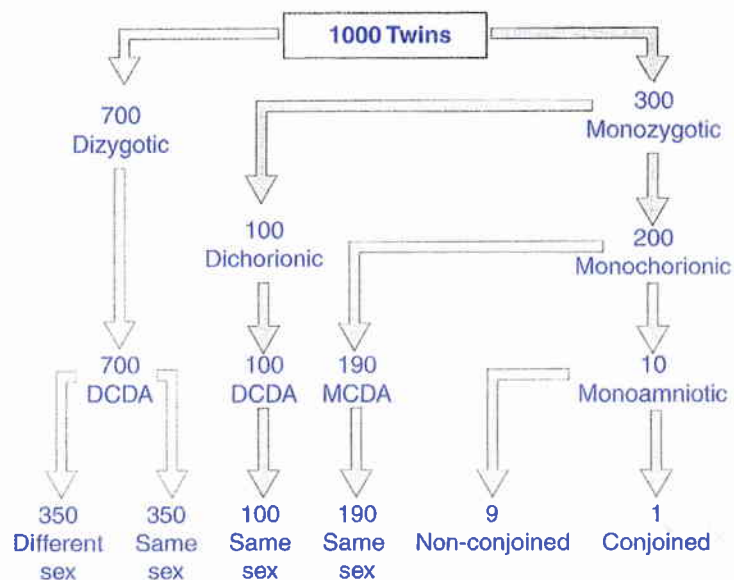
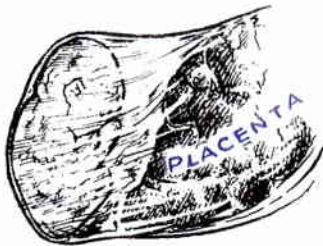
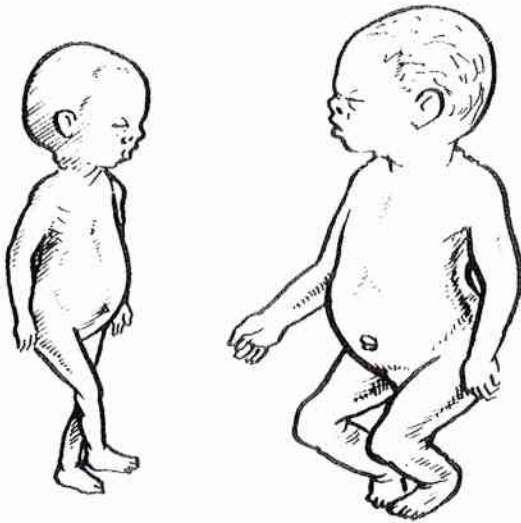


Diagram of chorionicity. Monozygotic pregnancies may form any of the following combinations depending on the gestation of embryo division: (A) dichorionic diamniotic; (B) monochorionic diamniotic; (C) monochorionic monoamniotic; (D) conjoined twins.



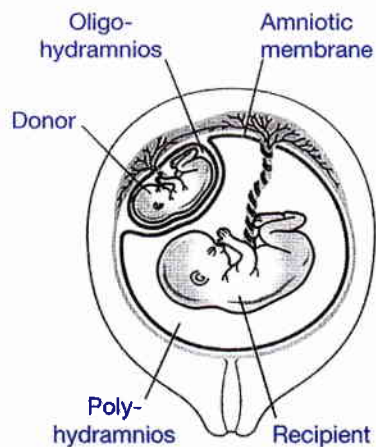
Incidence of monozygotic and dizygotic twin pregnancies. (DCDA, dichorionic diamniotic; MCDA, monochorionic diamniotic; MCMA, monochorionic monoamniotic.)

TTTTT



Fetus papyraceous

Sometimes a twin does not develop but becomes amorphous or shrivelled and flattened. This is called fetus papyraceous or compressus. It may be readily apparent or may be found wrapped in the membranes of the placenta.



Monozygotic twins demonstrating twin twin transfusion syndrome (Oligohydramnios—polyhydramnios Sequence).

Complications

ΦΦ.....↑ in both MMR & PNMR > singleton preg.....ΦΦ

① Maternal

1-Pregnancy

- **Early** Abortion.....Hyperemesis gravidarum
- **Late**
 - Poor nutrition & anemia.....Preterm labor✓✓
 - PET (Abruptio placenta).....Placenta previa (large placenta)
 - Pressure sympt (dyspnea, palpitation, Pyelonephritis, LL edema)
 - Polyhydramnios (chronic or in monozygotic)

2-During labor

- **1st stage**
 - PROM (non-engag. & malpresentations) → cord prolapse & infection
 - Prolonged labor (ut. inertia d.t. overdistension) → slow cx dilatation
- **2nd stage**
 - Obstruction due to malpresentation
 - Locking of twins (very rare)
 - Drop of IUPr after delivery of 1st baby → acc. hge. & splanchnic shock
- **3rd stage**PPHge & S₃

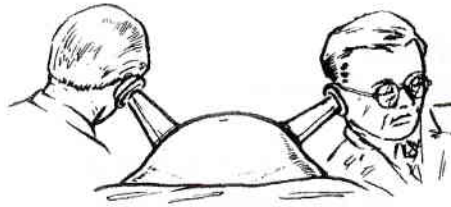
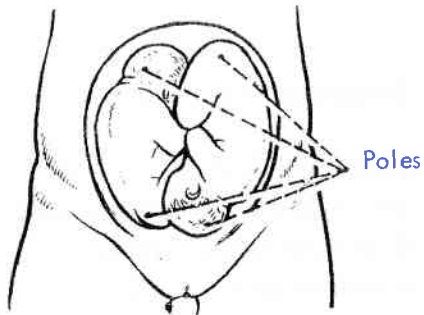
② Fetal

⇒ Only in monozygotic

- ☆ **Twin To Twin Transfusion syndrome** (intrauterine parabiosis)
 - Communication between the 2 fetal circulations (3rd circulation) & unequal distribution of blood between both fetuses (esp AV shunts)
 - One fetus is a DONOR → IUGR & even death (which becomes compressed: fetus compressus or fetus papyraceus) + oligohydramnios + hypotension, hypovolemia, anemia → high COP heart failure
 - The other fetus is a RECIPIENT → HYDROPS FETALIS (it receives most of blood → congestive heart failure) + polyhydramnios + hypertension, macrosomic, polyuria → poorer prognosis
- ☆ **Cord entanglement** (wrapping of cord on each other), **Single umb. artery**
- ☆ **Acute polyhydramnios**
- ☆ **Conjoined twins**

⇒ In both (esp if monozygotic or > 2)

- ☆ **CFMF** → increased incidence
- ☆ **PTL or IUGR** → (Low birth weight)
- ☆ **IUFD** → increased incidence (may occur in one fetus = single fetus demise)
- ☆ **Discordant twins** → size of one fetus is 20% < other (difference in bl supply)



Two fetal hearts may be heard but they must be heard at the same time and differ in rate by 10 beats.

Twins may present in various ways:—



Vertex and Vertex



Vertex and Breech



Breech and Breech



Vertex and Transverse

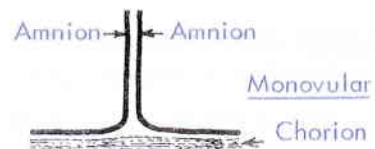
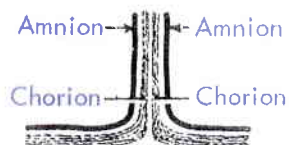


Breech and Transverse



Transverse and Transverse

Binovular
or
Monovular
Dichorionic



Clinical Picture

.....25% of antenatal diagnosis is missed.....

Symptoms

- **General** ⇨ comp:- e.g. pressure sympt., hyperemesis gravid.
- **Abdominal** ⇨ excessive enlargement

Signs

- **General** (excessive weight gain, LL edema, ± PET)
- **Abdominal**
 - INSPECTION → marked enlargement
 - PALPATION → . FL → > period of amenorrhea
 - . Umb Grip → multiple poles (at least 3 is diagnostic)
 - . Pelvic Grip → delayed engagement
 - AUSCULTATION
 - . 2 FHS are heard away from each other with difference > 10 b/m
 - . Arnaux sign → gallop heard between 2 points
- **During labor**
 - SLOW CERVICAL DILATATION, large bag of forewaters, PROM, cord prolapse, fetal pole is Small in relation to size of abd.
 - CONFIRM THE PRESENTING PART ⇨

	1 st	2 nd	Percentage
Most common	Cephalic	Cephalic	35
Then	Cephalic	Breech	20
Then	Breech	Cephalic	15
Then	Breech	Breech	10
Least is	Transverse	Transverse	5

Investigations...U/S Φ

- ▶ **Number:** earliest diagnosis (8 wks by TVUS)
 - However, 1 twin may disappear in 20 % of early diagnosed cases
 - vanishing twin → spontaneous abortion or fetus papyraceous
- ▶ **Zygoty**
 - Sex: if different → Binovular
 - Lambda sign γ (twin peak) → DC-DA twins (all dizygotic & 1/3 monozygotic).
The dividing membrane between the 2 fetuses is a double layer (chorion & amnion) from each sac, separated by a triangle-like tongue of decidua (extending from the placenta)
 - Tau sign → a thin membrane (2 layers of amnion) in MC-DA.
- ▶ **Complications** → polyhydramnios, CFMF, conjoined twin
- ▶ **FWB, Doppler, growth pattern** → for each fetus alone
- ▶ **Needed with other procedures** → CVS, selective embryoreduction

Management

Pregnancy

- DIET ✓ → ↑ protein, vitamins, minerals (iron), ↓ salt
- REST → . more periods of rest
 . Prophylactic cerclage, steroids, tocolysis
- EARLY TTT OF → any complication e.g. PIH, UTI
- FOLLOW UP FWB → for each fetus separately

Labor

- **1st stage** → avoid.....inertia.....PROM.....infection
- **2nd stage** → asses cervical dilatation, confirm presentation
 - Twin A (1st twin)
 - . Episiotomy ✓ + min. interference (↓ oxytocin, forceps, br. extraction)
 - . Immediate clamping of cord, no methergine ✓, exclude cord prolapse
 - Twin B (2nd twin) ↻

<i>Cephalic</i>	- Allow spontaneous delivery (within 20 - 30 min) - If fetal distress or > 20 m → .if engaged: ventouse or forceps .If not engaged: IPV & br extraction
<i>Breech</i>	- Spont. breech delivery - If distressed, prolonged → br. extraction
<i>Tr. lie</i>	- ECV or IPV & breech extraction (better)

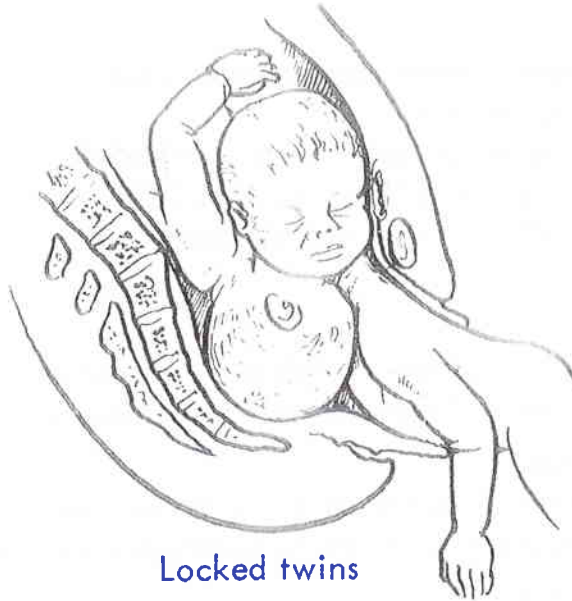
- **3rd stage**
 - Guard against PPHge.
 - Differentiation of twins (attended by 2 neonatologists)
 - * Placenta →
 - if 2 separated placenta → binovular & 1/3 monovular
 - if 1 placenta → may be binovular (50% fused) or 2/3 monovular
[Check septum between sacs by trying to peel the amnion from each other]
 - * Fetal sex, blood group, finger prints, HLA typing



Indications for CS +

- 1- Monoamniotic twinwhy?
- 1- 1st non-vertex presentation (rejected by some)
- 2- Retained 2nd twin if the cervix reforms & baby is distressed
- 3- Triplet or more
- ◆ Locked twin..... Conjoined twin

Locked twin



Locked twins



First trimester ultrasound showing quadruplet pregnancy

Extras **§ . . Locked twin**

- Rare problem (1/ 1000 of twins) → rupture uterus
- Only occur if twin **A** is **breech** & twin **B** is **cephalic**
- If occurred → decapitation of twin A followed by CS

® . . Retained 2nd twin

- Reformation of the cx → retention of the baby
- If occurred → CS: P₁ (previous vaginal & CS)
- What is the longest period between 2 twin babies?

Ω . . Conjoined twin (Siam)

- Thoraco-pagus✓, pyo-pagus, cranio-pagus, abdomino-pagus
- Very rare problem only in mono-zygotic twins

Ø . . Selective embryo reduction

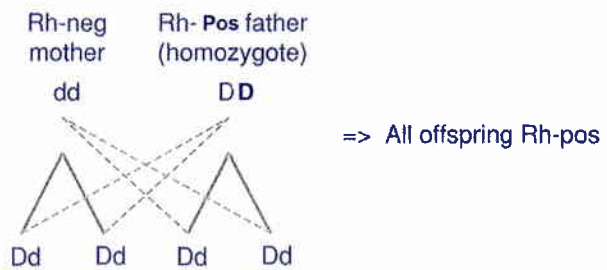
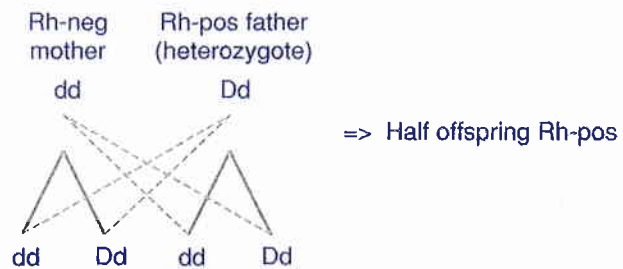
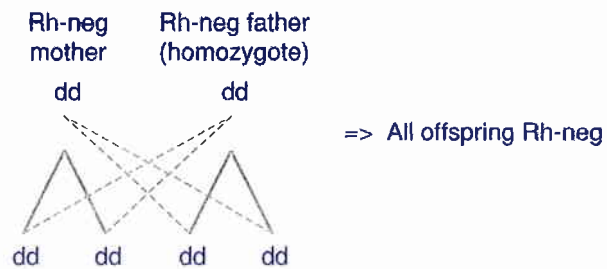
- Done mainly after IVF & ET to reduce number of twins
- Kcl is injected into 1 or 2 sacs guided by U/S
- Complication → infection, death of all sacs

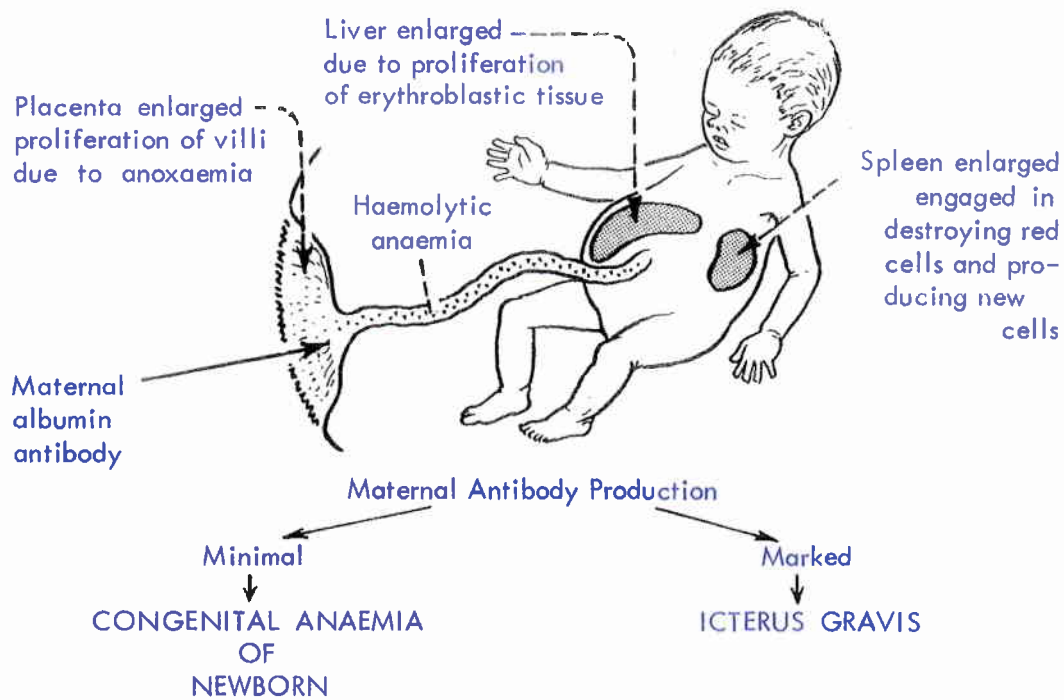
ξ . . Single fetal demise

- Conservation is done in the hospital
- Complication
 - Slow DIC (fibrinogen ↓es by 50 mg /wk)
 - Also thromboplastin may pass to the other baby (if there is placental communication)
- Management
 - Follow up fibrinogen level (critical level is < 100 mg%)
 - Prophylactic heparin could be given safely (intact vascular tree)

♣ . . Triplet

- Results from
 - Super-twinning (mono-zygotic triplet)
 - Tri-zygotic triplet
 - Twining of 2 ova & elimination of 1 of them
- Comp. → ↑ PNMR 10x^u (related mainly to IUGR & ↓ fetal weight)
- Pregnancy → cerclage is indicated^u
- Labor → CS





PathogenesisAttachment of IgG to fetal RBCs → haemolysis.....

- **Anemia** → anemic HF → G.edema
- **Extramedullary hematopoiesis** → hepato-splenomegaly →
Portal hypertension, Ascites, Hypoproteinemia → G.edema
- **Excess bilirubin production**
 - *Intra-uterine* → No Jaundice (placental transfer of bilirubin with subsequent detoxification by the maternal liver)
 - *Extra-uterine* → NNJ

Clinical types

► **Hydrops fetalis (most severe form)**

- * The baby is macrosomic with
 - Severe hemolytic anemia (N = 18gm%)
 - Generalized edema, ascites, scalp edema, hydrothorax.
 - Placenta → large edematous
- * The fetus usually dies in utero or with poor prognosis if delivered alive

► **Icterus gravidarum neonatorum (commonest)**

- * Only occurs after delivery (due to maternal protection) → bilirubin ↑ rapidly within few to 48 hrs → anorexia, vomiting, jaundice, anemia
- * In severe cases, bilirubin passes the immature BBB → deposited in the basal ganglia → Kernicterus (extrapyramidal effects + convulsions)
- * ↑ indirect bilirubin → yellow staining of amniotic fluid, cord, vernix

► **Congenital hemolytic anemia (mildest form)**

→ mild pallor & transient jaundice

Management

⇒ History

- **PG** → not affected except if --- & ---
- **MG** → previous history of:
 - 1st pregnancy → no effect
 - Later on → 1. neonatal jaundice (± need for exchange transfusion)
 - 2. hydrops fetalis
 - 3. recurrent IUFD
 - 4. recurrent abortion

① Rh-ve PG with Rh+ve father

- *There is a risk of having Rh+ve child*
 - If the husband is HOMOZYGOUS → every fetus will be Rh+ve
 - If he is HETEROZYGOUS → 50% will be Rh+ve
 - If the baby will be Rh-ve → no need for anti-D
- *Dosage availability*
 - 300 µg (for 30 ml fetal whole blood or 15 ml RBCs)
 - 50-100 µg is enough for abortion, ectopic[■]
 - If suspecting additional risk[■] (CS, APhge, manual removal of placenta)
 - ↳ do Kleihauer Betke test to calculate the dose
- *Arrange for anti-D prophylaxis (RhoGAM)*
 - Within 72 hrs[■] ...(even up to 3 wks, but with ↓ results)
 - Some give at 28 weeks (recently)[■]

② Rh-ve MG

- If she didn't receive anti-D after each pregnancy
- Do → indirect Coomb's test and Rh antibody titre
- Done initially and every month from 18–20 wks:

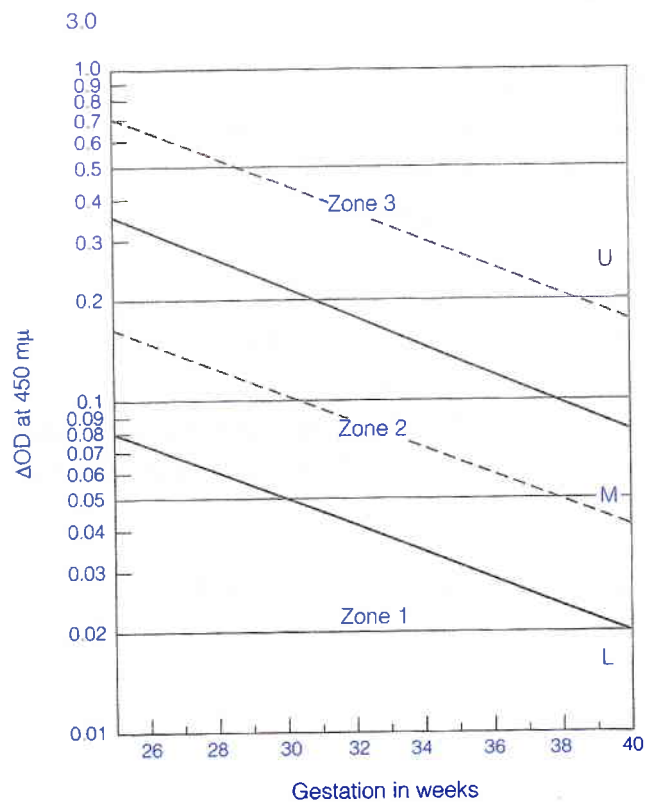


1) She is not sensitized & remains unsensitized

- * Just arrange for prophylaxis after delivery
- * Only **15 %**[■] of Rh-ve mothers are sensitized (1.5% of community) d.t.
 - a- Degree of fetomaternal transfer was not enough to elicit a response
 - b- ABO incompatibility between mother & fetus → destroy fetal RBCs
 - c- Not all Rh-ve mothers are immune responders (non-secretory)

2) She is sensitized → measure the antibody titre

- * If the IgG titre is $\leq 1/16$ or $< 0.5 \mu\text{g/ml}$ → minimal effect on fetus
 - ↳ allow to reach term with monthly testing for rising titre
- * If the titre $> 1/16$ (esp $> 1/64$) or $> 0.5 \mu\text{g/ml}$ (esp > 4)
 - ↳ suspect marked fetal affection so do Amniocentesis
 - As titer alone doesn't determine the severity[■]



Liley curve used to predict severity of fetal hemolysis with red cell isoimmunization.

⇒ Amniocentesis

Time (28–30 wks)

Unless there has been previous severe Rh disease then we do it 10 weeks before the gestational age at which fetal death occurred; but not < 18–20 wks

Measure

1] Bilirubin level = (Δ OD 450)

Measured by optical density at wave length 450 nm (spectro-photometry). Deviation from normal is plotted on a graph (LILEY chart)

Zone	Hemolysis (HB%)	Repeat > ...wks [±]	Delivery at
1. Low (a)	> 13 gm%	3	37
2. Mid (b): Low High	11–13	2	35 – 36
	8 – 11	1	34 – 35
3. High (c)	< 8 gm%	Rapid intervention	

2] L/S ratio for lung maturity

- if the L/S ratio is mature or after 35 weeks → CS
- If L/S ratio is immature or < 35 wks → intrauterine transfusion
 - Use O-ve packed RBCs
 - Amount = 10 ml for every week >20
 - Route = . Intraperitoneal (via *amniography*)
 . Intravascular (via *cordocentesis*)

OTHER INVESTIGATIONS

- *Fetal well being*
- *U/S* → fetal growth, amniotic fluid, fetal hydrops, IUFD (BORS)
- *PUBS* (**p**ercutaneous **u**mbilical **b**lood **s**ampling)
- *X-ray for hydrops*:
 - Buddha attitude of fetus
 - Halo around fetal skull (scalp edema)
 - Large placental shadow
 - IUFD

⇒ Mode of termination

- ✓ C.S. safer & less traumatic
- ✗ Vaginal esp if minimal affection or not sensitized (avoid oxytocin)

Neonatal Jaundice

	Physiological (50%) [□]	Pathological
Etiology	Excess RBCs + immature liver	- Prehepatic (intra...extra-vascular) - Hepatic.... - obstructive
C/P	FT 24 hr (↓ after wk) PT 48 hr (↓ after 9-10d)	According to the etiology
Inv.	unconj. bil. < 12 mg/dl [□]	unconj or conj (↑ > 5mg / dl / day)
TTT	phototherapy...Phenobarbital....albumin...exchange transfusion	

Management of Neonate (In NICU by expert)

❖ Cord blood analysis for [Ⓜ]

- Blood group, Rh, Reticulocytes
- Hb (<15 gm/dl → exchange transfusion)
- Bilirubin (> 20 mg/dl or rise 1 mg/hour → exchange transfusion)
- Direct [Ⓜ] Coomb's test

❖ Exchange transfusion (± phototherapy) in case of

- Previous bad obstetric history of IUFD, NND
- Increased bilirubin
- Decreased Hb
- If premature → lower threshold as brain is very vulnerable

EFFECTS OF EXCHANGE TRANSFUSION (O-VE FRESH BLOOD)

- Provides Rh-ve blood cells to improve anemia
- Rh-ve cells are not susceptible for haemolysis
- Removal of antibody
- Removal of bilirubin

Postpartum Counseling

In repeatedly severe affected cases + Homozygous father →

- 1] Consider termination & contraception
- 2] Trials to modulate maternal immunity

☆ Plasmapheresis

Maternal blood is exchanged & washed
(may lead to rebound increase)

☆ Promethazine (Phenergan) & Corticosteroids

May alter fetal immune response to coated RBCs

☆ Desensitization

By repeated injection of husband RBCs

☆ Rh+ve erythrocyte membrane in enteric coated capsules

Taken orally in attempt to induce Suppressor T-cell formation

☆ Bone marrow transplantation

From Rh-ve donor into fetal peritoneal cavity

Q. What is Whitfield line of action ?

Q. Define hydrops fetalis ?

Q. What are types of hydrops fetalis ?

Q. Discuss neonatal jaundice ?

Etiology

..... Idiopathicin 60% of cases✓✓

Genetic - Hereditary -	Environmental Factors
1) Genetic (7.5%) * Autosomal → hemoglobinopathies, PCK * Sex chrom. → hemophilia, m. dystrophy 2) Chromosomal (6%) * Numerical - Triplicate . Autosomal ...Trisomy . Sex chrom...47xxy - Monosomy.....Turner (45xo) * Structural → deletion, translocation	1) Extrinsic - Environmental (pollutants) - Drugs (androgen, thalidomide) - Physical (irradiation) 2) Intrinsic * Mother → DM, phenyl-KU * Fetal infection - Viral (rubella, CMV, parvovirus B-19) - Toxoplasmosa gondii, Syphilis * Placenta → F.hypoxia as P.previa * A.fluid.: oligamnios (T. equinovarus)

Diagnosis

➡ Prenatal Diagnosis

① History

- Maternal age ≥ 35 years
- Positive family / obstetric history
- Positive history of exposure to environmental factors or drugs

② Clinical picture

- Polyhydramnios ⇔ anomalies which interfere with AF circulation
- Oligohydramnios ⇔ renal agenesis (Potter syndrome)

③ Investigations.....very ⚠ very important

○ Non-invasive

- Sonography & MRI
- Triple screen test ($\downarrow$ α -feto-protein.... $\downarrow$ estriol.... $\uparrow$ β -HCG)

○ Invasive

- PGD...CVS....Amniocentesis.....Cordocentesis.....Embryoscopy
- To assess ⇔ karyotype, gene probe, inborn enz. errors, fetal sex

➡ Postnatal Diagnosis.....many cases are only diagnosed by routine examination

FETAL THERAPY



→ TOP

* only the **Major CFMF** ⇔ 2-5% either:

- Incompatible with life → *anencephaly*
- Producing major dysfunction → *mental retardation*
- Requiring major surgery for correction → *congenital heart disease*

* **Not the Minor CFMF** ⇔ 10% e.g.: skin tags, extra digit, accessory nipple

→ Measures to reduce CFMF

- Folic acid (3m < & > preg)✓ → prevent NTD
- Strict control of blood sugar → in DM
- Oral hypoglycemics & anticoagulants → are stopped in pregnancy
- For Phenylketonuria patients → take a low phenylalanine diet
- Mega doses of vitamin A & D are avoided → highly teratogenic ☹

① Medical Fetal Therapy

1. **Aspirin**✓ (75 mg /d) ⇔ PET, IUGR, habitual abortion (APS)
2. **Betamethasone or dexamethasone** ⇔ ↑ lung maturity
3. **Prostaglandin inhibitors** ⇔ PTL & polyhydramnios
4. **Antibiotics** ⇔ if +ve vaginal swabs for GBS (↓ neonatal sepsis)
5. **Vitamin K** may ⇔ ICHge (esp in PTL)
6. **Digoxin** ⇔ for fetal arrhythmias
7. **Thyroxine** ⇔ for congenital goitre
8. **Gene therapy** ✓✓✓ is still experimental

② Surgical Treatment in Utero

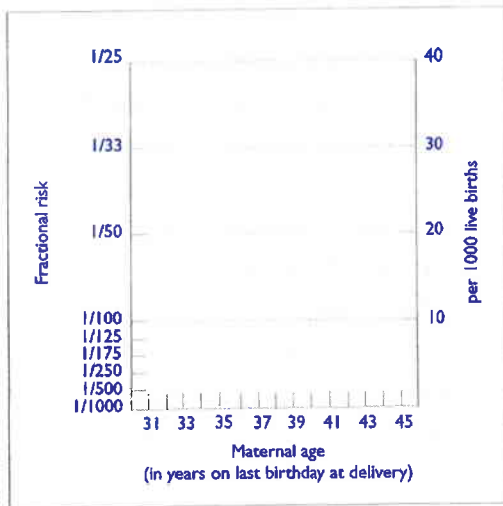
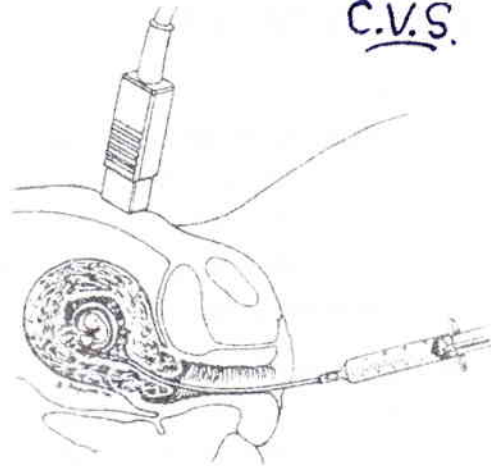
→ Closed Fetal Surgery (U/S guided)

- ☆ **Intrauterine fetal transfusion** in case of erythroblastosis fetalis
- ☆ **Amnio-Infusion** in cases of oligamnios, MAS
- ☆ **Shunt operations**
 - Hydrocephalus → cephalocentesis or ventriculo-amniotic shunt
 - Hydrothorax → a thoraco-amniotic shunt may be done
 - Hydronephrosis → vesico-amniotic shunt
 - Fetal cystoscopy with laser ablation of posterior urethral valve
- ☆ **Twin-to-twin transfusion syndrome** the following may be tried:
 - Laser coagulation of the anastomosing vessels **through** fetoscope
 - Digoxin (to prevent fetal heart failure)
 - Indomethacin for polyhydramnios associated with large fetus

→ Open Fetal Surgery / Fetoscopy

- ☆ Urinary tract obstruction (1st surgery done1982)
- ☆ Sacro-coccygeal teratoma (the commonest tumor of the newborn)

C.V.S.



The rate of Down's syndrome in live births in relation to maternal age.

History

John Langdon Down (1828–1896) was a liberal Victorian physician who defended the higher education of women, opposed slavery, and supported the unity of mankind. In a paper entitled 'Observations on the Ethnic Classification of Idiots' he put forward the theory that it was possible to classify different types of conditions by ethnic characteristics. He listed several types, including Down syndrome, which he classified as the 'Mongolian type of Idiot'.



The nuchal lucency measurement is seen behind the fetal neck marked by the callipers ++

Investigations for CFMF

1) Biopsy

☆ Preimplantation genetic diagnosis (PGD)

- In cases of IVF & ET
- 1-2 cells (blastomeres) are aspirated from morula at stage 6 or 8 after making a hole in the ZP by laser or chemicals

☆ Chorionic Villous Sampling (U/S guided)

- Time → 8-12 weeks[■]
- Cells aspirated studied for
 - . Karyotyping & gene probing
 - . Enzymes → inborn error of metabolism / Hb-pathies
 - . Determination of fetal sex
- Comp. → bleeding (abortion: 5%), infection

2) Imaging techniques

- U/S → used to screen CFMF at 16-18 weeks
(= level II U/S, anomaly scan)
- 3D U/S → for more details.....4D U/S (live scan)
- CT, MRI → expensive

3) Screening

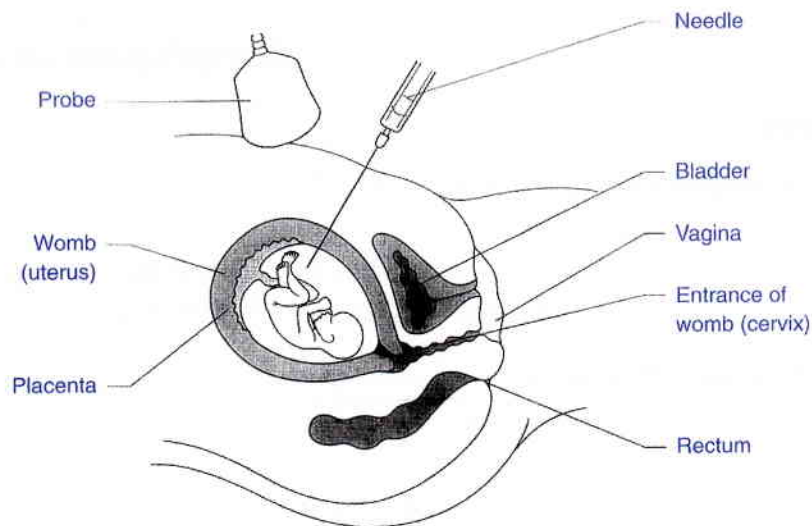
► Alpha-feto-protein

- It is a protein formed mainly by the fetal liver & yolk sac[■]
- Measured at 16 wk (*amniotic fluid*) or at 30 wk (*maternal serum*)[■]
 - . ↑ in twins, fetal death, CFMF (anencephaly & exomphalos)
 - . ↓ in Down syndrome[■]

► Triple screen test for Down[■]

- * Screening should be offered for all during ANC (esp if >35yrs)
- * Screening is done between 11-14 wks
 - ↓ α-feto-protein.....↓ estriol.....↑ β-HCG
 - Improved by adding PAPP-A (plasma associated plasma protein A): Quadr test
- * Sensitivity increases to 80% by adding nuchal thickness (1.5 mm).
Improved by measuring nasal bone, frontomaxillary nasal angle, presence of tricuspid regurge, ductus venosus wave form, femur length

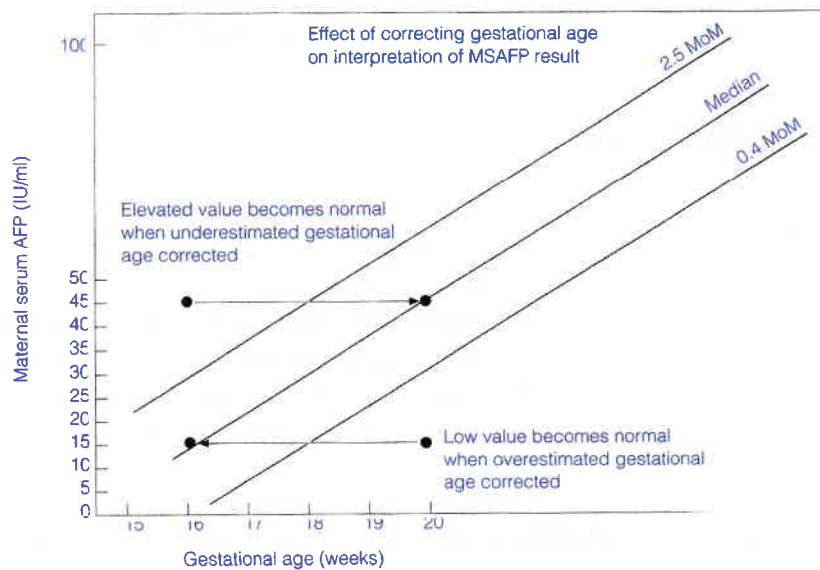
.....It is just a screening risk.....that shows the **risk** probability for Down adjusted with age.....**confirmation** needs invasive procedure (karyotyping)...



Picture from the RCOG information leaflet of amniocentesis

Triple Screen Table

	Trisomy 21	Trisomy 18	Trisomy 13
MSAFP	Decreased	Decreased	Depends on defects
Estriol	Decreased	Decreased	Depends on defects
β -hCG	Elevated	Decreased	Depends on defects



4) Amniocentesis



☆ Indications

- ▶ **Early at 16-18 wks**
 - ◆ Genetic studies.....(esp in old age or +ve history of CFMF)
 - ◆ AF α -Feto-protein....(MS- α FP is easier)
- ▶ **In midtrimester** $\Rightarrow \Delta$ OD 450 $\rightarrow$ plot on Lilly's chart
- ▶ **In third trimester**
 - ◆ **For estimation of lung maturity**
 - L/S ratio > 2 / Lecithin / Phosphatidyl glycerol
 - Bubble stability test
 - Nile blue sulfate test (mature shedded fetal epithelial cells)
 - Creatinine concentration $> 2\text{mg } \%$
 - ◆ **Amniography for**
 - Diagnosis of PROM $\pm$ intrauterine infection by AF culture
 - Outlines GIT for intraperitoneal transfusion (in RH-ve)
- ▶ **Therapeutic**
 - ◆ Tapping of polyhydramnios
 - ◆ Induction of abortion by injection of PG or saline, urea **XX**

☆ Complications

- Maternal $\rightarrow$ injury to bladder, intestine, vessels
- Fetal $\rightarrow$. PROM $\rightarrow$ abortion or PTL
 - . Injury to fetal vessels $\rightarrow$ fetal hge.
 - . Infection $\rightarrow$ septic abortion or chorioamnionitis
 - . Trauma to fetal organs (puncture)

☆ Others

- **Cordocentesis**
 - U/S guided puncture of umbilical vessels near the placental insertion
 - Withdraw blood $\rightarrow$ diagnosis: infection, bilirubin, anemia, genetic studies
 - Injection of drugs directly $\rightarrow$ fetal therapy
- **Embryoscopy**
 - Endoscope passed transcervically under U/S guide
 - Used to diagnose $\rightarrow$ CFMF (external visualization)
- **Fetoscopy**
 - Endoscope passed abdominally under U/S guide
 - Used for $\rightarrow$ skin & liver biopsy

DRUG USE IN PREGNANCY



- Drugs are responsible for only 2-3% of CFMF
- Drug is considered teratogenic if 5% of offspring had identical defects.....imp.
- The teratogenic period extends from 4th-10th wk of pregnancy (organogenesis)
- X-ray dose > 5 rads is hazardous (single exposure.....0.5 rads) [▪]

FDA classification of drugs in pregnancy (1980)

A	Animal / human studies show → no risk
B	Animal studies show risk / human studies → no risk
C	Animal studies show risk / human studies → not adequate
D	Risk of fetal teratogenicity (but <i>benefit</i> of drug use outweighs fetal <i>risk</i>)
X	Definite fetal teratogenicity (absolute contraindication in pregnancy)

Aspirin (not teratogenic)

- LOW DOSE ASPIRIN (75 mg daily) is used in
 - . Prophylaxis for PET, recurrence of IUGR
 - . Habitual abortion (d.t. autoimmune disease as SLE & APS)
 - . Tocolytic (antiprostaglandin → used for PTL)
- DISADVANTAGE
 - . It ↓ platelet aggregation → prolongs bleeding time (APHge & PPHge)
 - . In newborn → neonatal hge, hyperbilirubinemia → neonatal jaundice (it competes with bilirubin for binding with albumin)

Anticoagulants

1. Oral anticoagulants....leads to
 - Abortion, IUGR, IUFD, maternal & fetal hge
 - Fetal warfarin synd. (>5mg)→ microcephaly, chondrodysplasia punctata
2. Heparin
 - Best → doesn't cross placenta & not secreted in milk
 - Maternal comp. → hge, thrombocytopenia, osteoporosis (if > 6 m)

Alcohol....fetal alcohol syndrome:-

- . Growth retardation before and/or after birth
- . Characteristic craniofacial anomalies
- . Mental retardation

Antihypertensives

- Most antihypertensives are safe except ↘
- The angiotensin-converting enzyme inhibitors (e.g. *captopril*) **XX** →
 - . Fetal renal failure, oligohydramnios, lung hypoplasia
 - . Craniofacial & limb anomalies

Antibiotics

1. Penicillins, erythromycin, cephalosporins ✓✓ ⇒ the 1st line therapy
2. Antituberculous, flagyl, acyclovir, antifungal ⇒ not teratogenic
3. Sulphonamides ⇒ avoided in 3rd trimester → fetal hyperbilirubinaemia [⚠]
4. Tetracyclines ⇒ combine with Ca^{++} in bone & teeth → yellow discoloration
5. Aminoglycosides ⇒ 8th nerve damage & congenital deafness

Anticonvulsants:- Phenytoin (Hydantoin)

- Fetal hydantoin syndrome (↓ absorption of folate)
- MR & characteristic craniofacial anomalies
- Prophylaxis 5mg *folic acid* daily to prevent NTD
- In Grand-mal-epilepsy → give anticonvulsants
 - ↳ the benefit of drugs outweighs the risk of stopping them
- In Petit-mal-epilepsy → stop anticonvulsants
 - ↳ the risk of fetal teratogenicity outweighs their benefit

Antidepressants (Lithium) ⇒ teratogenic:-

- Cardiac anomalies, fetal goitre, polyhydramnios (diabetes insipidus)
- Must be given in pregnancy (with follow up by U/S & echo)
 - ↳ as stopping may lead to → relapse of mental illness

Immunosuppressant drugs ⇒ not teratogenic:-

- **Azothioprine** (Imuran) → infection, bone marrow depression, hepatotoxicity
- **Cyclosporine, cytotoxic** → may lead to IUGR, PTL, multiple CFMF

Antithyroid Drugs

- **Propylthiouracil** ⇒ the drug of choice in pregnancy
 - ↳ However, they cross placenta → fetal hypothyroidism (goitre)
- **Iodide** (e.g. KI expectorant) → fetal hypothyroidism and goitre

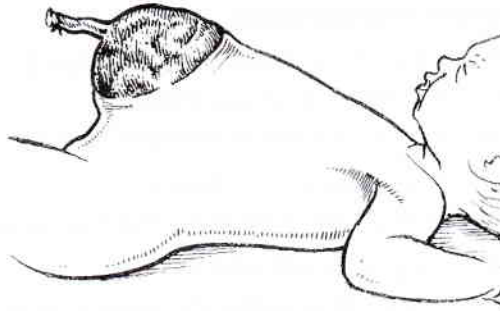
Steroid Hormones

- COC → not teratogenic
- Progestogens (synthetic) → enlarged clitoris, fused labia minora
- Danazol → produces the same effects

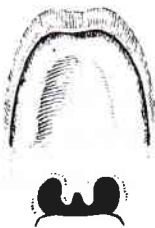
Vitamins

- Folate deficiency → neural tube defects (anencephaly, spina bifida)
- Mega doses of vitamin A (>15,000 IU daily) are teratogenic ⚠
 - ↳ isotretinoin (accutane)
- Mega doses of vitamin D are teratogenic

EXOMPHALOS



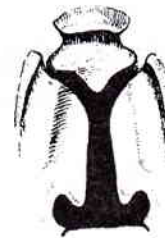
Bilateral cleft lip
(‘Hare lip’)



Cleft of soft
palate
(Bifid uvula)



Unilateral cleft
palate



Bilateral cleft
palate

SPECIFIC STRUCTURAL CFMF



OOPS!

① GIT ANOMALIES

1- Omphalocele (exomphalos)

- Congenital herniation of some of the intra-abdominal contents

2- Malformations presenting with intestinal obstruction

- *Bowel obstruction above the ileum* → polyhydramnios
- *Bowel obstruction below the ileum* → generalized distention of bowel loops

3- Other gastrointestinal anomalies

- *Cleft Lip* → unilateral or bilateral → feeding problems
- *Cleft Palate* → 1. Bifid uvula
2. Cleft soft / bony palate
3. Gap in the alveolar arch

② UROGENITAL

1- Renal agenesis (Potter's syndrome)

- Renal agenesis
- Oligohydramnios → pulmonary hypoplasia, IUGR
- Compressed facial features → flattened nose, small chin, low-set ears

2- Obstructive uropathy

- U/S → enlarged bladder ± hydronephrosis
- Types: A. Pelvi-ureteric junction obstruction → prognosis is good
B. Posterior urethral valves → occur in males
C. Complete urethral stenosis → anhydramnios

3- Ectopia vesica

- Defect in anterior abdominal wall that involves the bladder
- In exstrophy of bladder → the trigone and urethral orifices are exposed

③ CARDIOVASCULAR

Types ⇨ VSD, PDA, ASD and pulmonary stenosis, Fallot's tetralogy

Association of ⇨ extra-cardiac lesions are present in 30 % of cases

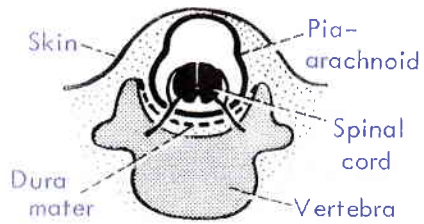
U/S ⇨ Four-chamber view of heart, Doppler color-flow mapping

*** **Single umbilical artery (DM, twins)** ⇨ IUGR, accidental hge.

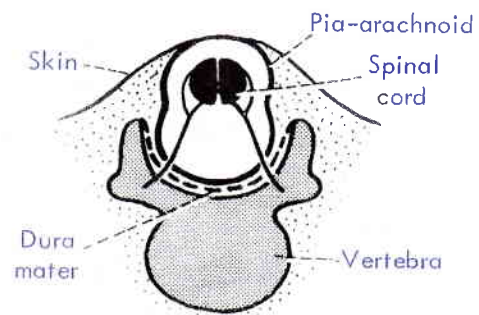
ANENCEPHALY



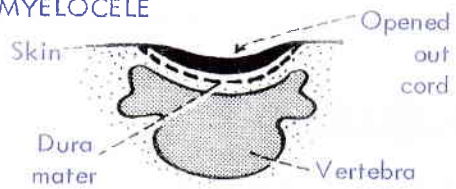
MENINGOCELE



MENINGOMYELOCELE



MYELOCELE



④ CNS ANOMALIES

1- Anencephaly (> in girls)

- *Def* ⇔ a lethal anomaly ccc by absence of skull, cerebral hemispheres
- *Inv.* ⇔ U/S (polyhydramnios) ± ↑ MS α-FP, AFα-FP
- *TTT* ⇔ 1. Early detection → TOP
2. Hazards → shoulder dystocia & post maturity
3. Avoid recurrence → folic acid

2- Hydrocephalus ☺ ☺ ☺

- *Def* ⇔ excess CSF within the ventricles & the subarachnoid space
- *Etiology*
 - . Congenital cerebral malformations: e.g. Arnold-Chiari malformation
 - . Obstruction of aqueduct of Sylvius: infections or chr (triploidy, trisomy)
- *Management*
 - * **Intrauterine therapy** (ventriculo-amniotic shunts)
 - * **TOP could be offered; however good prognosis**
 - . If no associated anomalies are found
 - . Mild degree (cerebral mantle left > 1 cm) 🐼

3- Spina bifida

- *Def* ⇔ failure of fusion of the 2 halves of the vertebral arches
- *Prognosis depends to* ⇔
 - . Severity of neurological involvement
 - . Associated anomalies: e.g. hydrocephalus (90%), skeletal
- *Types*
 - ➡ **Spina bifida occulta**: bone defect only ± tuft of hairy → good prognosis
 - ➡ **Spina bifida cystica** (meningocele, meningomyelocele, myelocele)

⑤ HYDROPS FETALIS 📖

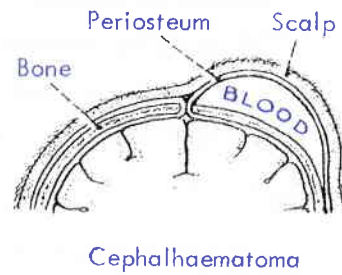
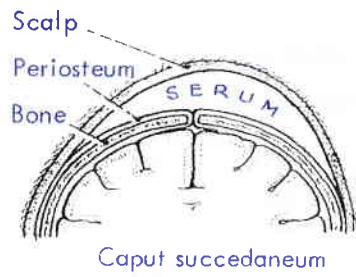
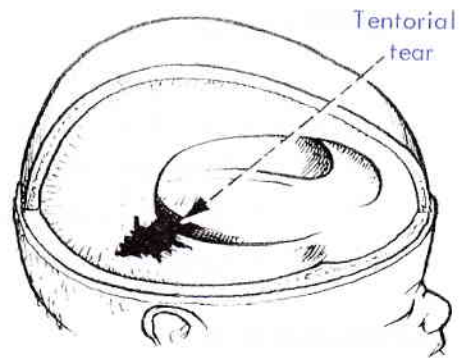
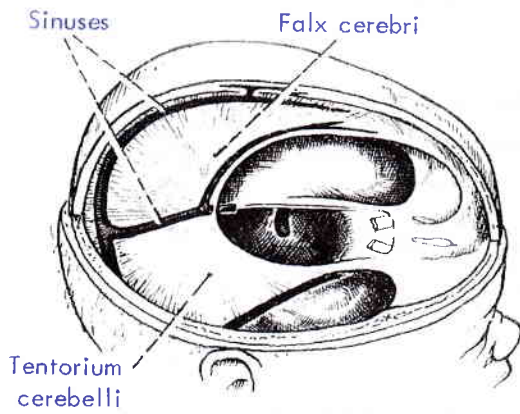
Definition (U/S criteria) ⇔

- General skin edema (> 5 mm) +
- Fluid in ≥ 2 serous cavities +
- Placental thickening: > 4 cm

Etiology ⇔

1. Immune → Rh isoimmunization
2. Non-immune (worse 🐼) ➡ ➡

- . Causes of generalized anasarca
- . Intrauterine infections → hemolysis
- . Chromosomal: Turner's, trisomy 18, 21
- . Hb-pathies: e.g. α-thalasaemia [□] (not β)
- . Twin-to-twin transfusion



The gallows splint is the most convenient method of treating fracture of the femur

FETAL BIRTH INJURIES



① HEAD INJURY

1- Intracranial hge

► Etiology

1. *Marked compression* ✓ ⇨ e.g., forceps, ventouse.....CPD
2. *Rapid compression-decompression* ⇨ after coming head.....PPT labor
3. *Prematurity* ⇨ ↓ prothrombin.....fragile blood vessels.....soft bones

► Sites

- *Subdural / Subarachnoid*
- *Periventricular, intraventricular, intracerebral*
- *Cephalhematoma* (DD ⇨ caput succedaneum)

► Management

- **Prophylaxis** ⇨ proper management of labor → avoid traumatic delivery
- **Active** - Vitamin k (1 mg I.M.) ✓
 - Oxygen ± antibiotics ± anticonvulsants

2- Fractures of the skull

- **Linear** ⇨ more common.....heal without complication (within days)
- **Depressed** ⇨ occasional.....treated by elevation (manual, ventouse)

② MUSCULO-SKELETAL

1- Fracture clavicle

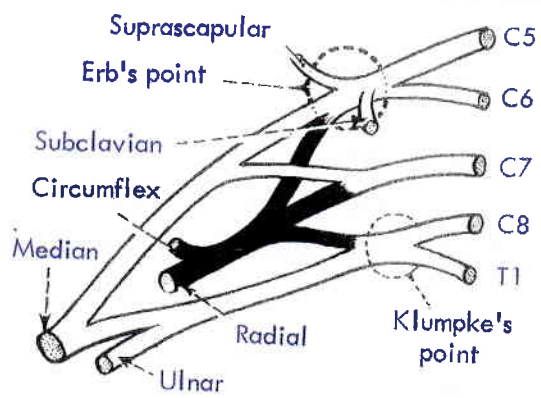
- The most common fracture in newborn
- Management
 - . If the fragments of bone are not dislocated → no ttt
 - . If fragments are dislocated → 8 shaped-figure bandage

2- Fracture of long bones

- The most common is humerus and femur
- Management → immobilization by elastic bandage for 2-3 wks

3- Injury to Sternomastoid muscle

- The infant holds the head to one side (torticollis)
- A mass (1-2 cm) is noticed → complete recovery in 2-3 m



FACIAL PALSY



③ PERIPHERAL NERVE

1- Brachial plexus palsy

- ▶ Etiology $\Rightarrow$ *shoulder dystocia*
- ▶ Types
 - Erb's palsy $\Rightarrow$ C_{5,6}
 - Waiter's tip" posture
 - Moro reflex is asymmetrical
 - Klumpke's paralysis $\Rightarrow$ C₈ to T₁
 - Flexor and extensor muscles of the wrist are weak
 - The grasp reflex is impaired
 - Horner's syndrome (involvement of T₁ symp fibers)
- ▶ TTT $\Rightarrow$ most infants show recovery within 2-3 weeks $\pm$ passive exercises

2- Facial Palsy

- ▶ Etiology $\Rightarrow$ *forceps*
- ▶ TTT $\Rightarrow$
 - Dribbling is observed during sucking (most infants recover in 3-4 d)
 - The eyes should be protected with methyl-cellulose drops
 - Patients should be re-examined to differentiate *neurapraxia* (edema of the nerve) from *neurotemesis* (true nerve injury)

3- Paralysis of phrenic Nerve

- ▶ Etiology $\Rightarrow$ cervical roots of C₃₄₅ are involved (as in head traction in breech)
- ▶ C/P $\Rightarrow$ tachypnea, cyanosis, apnea
- ▶ TTT $\Rightarrow$ complete recovery within 4-6 wks

④ SOFT TISSUE

1- Lacerations

- Head lacerations $\rightarrow$ blade during CS, scissors during episiotomy
- Vulval lacerations $\rightarrow$ in frank breech presentations (due to PV)

2- Scalp Abscesses

- Occasional complication of internal monitoring

3- Abdominal organs

- Internal hge during breech extraction (esp liver, spleen, kidneys)

	Hepatitis A	Hepatitis B	Hepatitis C	Hepatitis D ('delta')	Hepatitis E	Hepatitis G
Transmission	Faecal-oral	Parenteral Mucosal Sexual	Parenteral Mucosal Sexual	Parenteral	Faecal-oral	Parenteral
Chronic disease	None	2–6% adults	80%	70–80%	None	Rare
Fetal transmission	Rare	20–30%	5–10%	Cases reported	No cases reported	No cases reported
Vaccination	Safe in pregnancy	Safe in pregnancy	None available	HBV safe in pregnancy	None available	None available

HBV, hepatitis B virus.

FETAL INFECTIONS

① Rubella (german measles)

- ▶ **Maternal infection**....droplet infection (naso-pharyngeal) –togavirus–
- ▶ **Fetal infections**.....congenital rubella syndrome
 - More common in → earlier pregnancy (1st trimester)
 - The commonest features → cataract, deafness, PDA
- ▶ **Diagnosis**.....rising IgM titre
- ▶ **Prevention** ☺ ☺
 - Vaccination of all females **before** pregnancy (MMR)
 - **Screening** should be offered for all females in first ANC visit
 - If pregnant → vaccination (live attenuated) is **contraindicated**
 - If exposed in the 1st trimester (80% fetal affection)→ TOP is **advised**

② Toxoplasmosis

- ▶ **Organism** → toxoplasma gondii –protozoa–
- ▶ **Transmission**
 - It is found in → intestine of cats & ms of cattle (definitive hosts) [■]
 - Maternal infection → handling of oocytes (stools of cats or raw meat)
 - Fetal infection → chorioretinitis, blindness, hydrocephalus, IUGR, IUFD
- ▶ **Diagnosis**....rising IgM titre
- ▶ **TTT** → . Spiramycin (rovamycin) could be used in pregnancy
 . Pyrimethamine sulphadiazine (avoid in 1st trim.→ folic acid antagonist)

③ Viral hepatitis

- ▶ **A**.....Hepatitis A Ig is given on exposure or traveling to endemic areas
- ▶ **B**.....
 - Routine screening is **done** in the 1st antenatal visit
 - If +ve → the newborn is given Hepatitis B immunoglobulin + the vaccine
 - Also exposed sero-ve mothers are given Hepatitis B Ig + the vaccine
- ▶ **C**.....
 - Routine screening is reserved for high risk cases only
 - No active immunization is available
 - Only passive immunization by Hepatitis C Ig

④ Chickenpox

- ▶ **Organism** → varicella Zoster virus ((herpes group))
- ▶ **Complication**
 - Mother → mortality 5x non-pregnant ... pneumonia, hepatitis, encephalitis
 - Fetus → skin scarring, eye defects (chorioretinitis, cataract), hypoplasia of limbs, neurological abnormalities & developmental delay
- ▶ **Management**
 - If woman reports contact (> 15 minutes face to face in same room) → VZ IgG is checked → if -ve (not immune) then VZ-IG is given soonly (effective up to 10 days from exposure)
 - If chickenpox developed → acyclovir 800 mg 1x5x7

⑤ Group B streptococcus

- ▶ **Organism** → G+ve coccus (common vaginal commensal)
- ▶ **Prevalence** → most common cause of early onset neonatal sepsis (<7 days)
- ▶ **Screening** → not recommended as routine before labor (except USA)
- ▶ **Risk factors** → prolonged ROM, PTL, fever, bacteruria, previous infant with GBS
- ▶ **Management**
 - Penicillin 3g IV at onset of labor to be repeated 1.5 gm 4 hourly
 - No need for therapy in planned CS with no ROM

⑥ Herpes

- ▶ **CS should be recommended** for those with 1st herpes at time of delivery or within 6 wks from EDD
- ▶ **VD is allowed** if recurrent herpes (risk of fetal affection is small 1-3%) → delay / avoid AROM, reduce invasive manipulations as much

⑦ Chlamydia

- ▶ **Infection** is frequently asymptomatic during pregnancy
- ▶ **Risk of** → PROM, PTL, LBW
- ▶ **Azithromycin / Erythromycin** may be given safely (avoid doxycycline)

⑧ Parvovirus B19

- ▶ **Transmission** is droplet (pregnant teachers who work with young children)
- ▶ **Symptoms** are flu-like and diagnosis is by rising IgM titre
- ▶ **Fetal affection** may lead to → aplastic anemia → hydrops fetalis

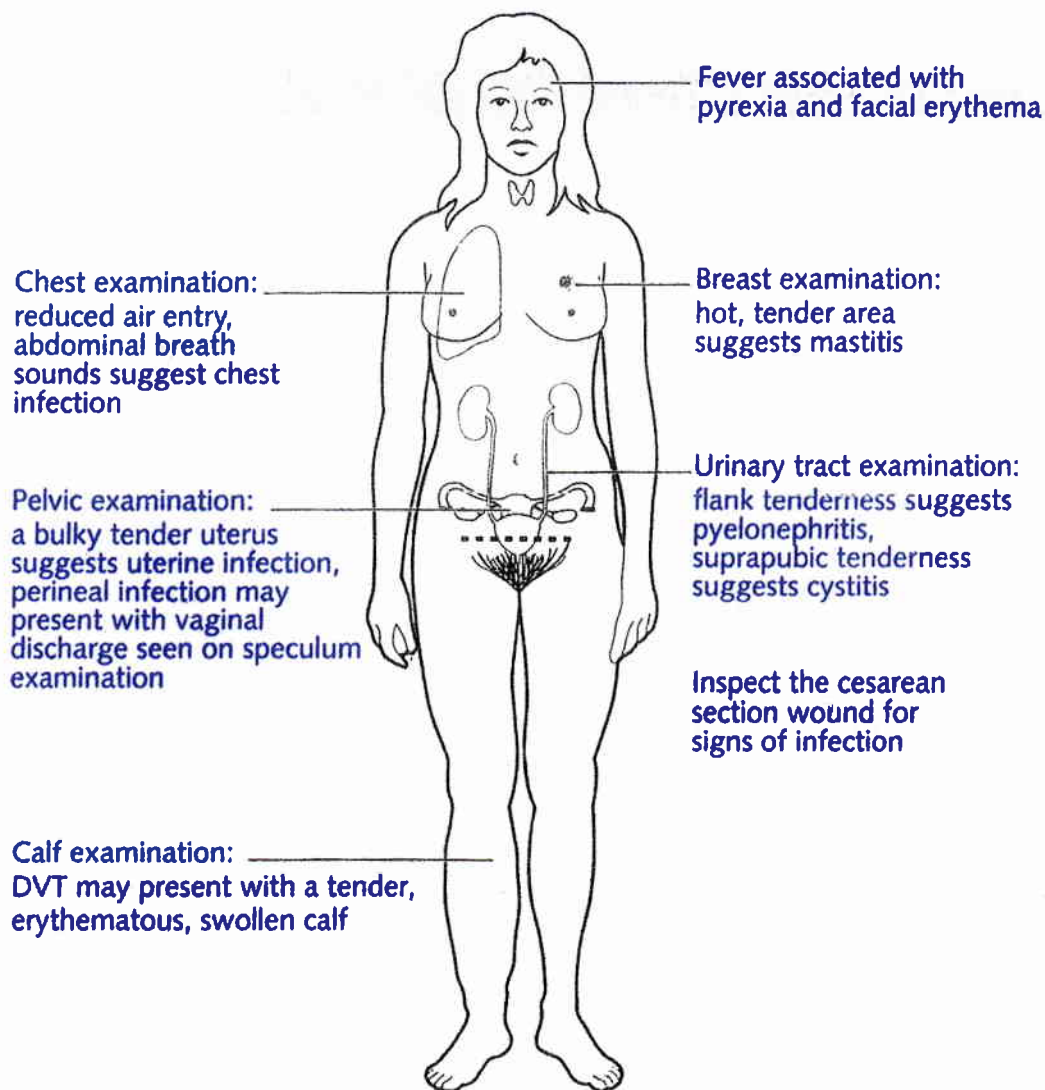
Chapter

4

Puerperium

Puerperium

Maternal Mortality Rate (MMR)



Puerperium

Definition

The period after delivery ($\approx$ 6 weeks; 42 days) during which certain changes occur in the BODY & GENITAL TRACT to return to the non-pregnant condition

① General body changes

1. Temperature $\Rightarrow$ may $\uparrow$ in the 1st 24 hours but $< 38^{\circ}\text{C}$ & < 24 hrs (absorption of waste products after muscular effort)

- **Pulse** $\Rightarrow$ normal [tachycardia denotes *infection* or *hge*]

2. Urinary tract

- *Retention* may occur in the 1st few days due to
 - Lax abdominal wall
 - Atony of bladder
 - Painful episiotomy or lacerations
- Volume $\rightarrow \uparrow$ in the 1st few days to excrete fluid retained in pregnancy
- Dilatation of urinary tract resolves in 12 weeks
- Lactosuria & some peptones (due to autolysis of uterine ms fibers)

3. GIT

- *Constipation* may occur due to
 - Lax abdominal wall
 - Atony of intestine
 - $\downarrow$ fluid intake + $\uparrow$ sweating $\rightarrow$ eliminate excess fluids
- Thirst & loss of appetite may occur $\rightarrow$ dehydration

4. Blood

- All changes become gradually reversed
- Increased liability to thromboembolism in the 1st few days

5. Breasts

- Larger, firmer, heavier
- Colostrum appears for 1st few days
- Milk appears later 3rd or 4th day

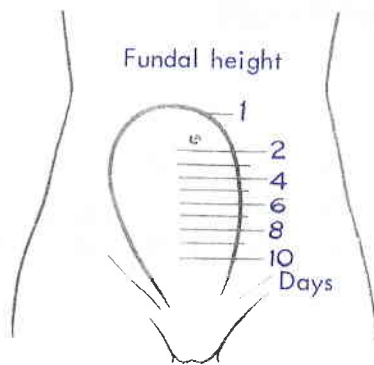
	Colostrum	Milk
Protein [□]	6%	1%
Fat [□]	2.5%	3.5%
CHO [□]	3%	7%

6. Abdominal wall

- Gradual regain of tone (helped by exercise)
- Striae $\rightarrow$ become white (albicans)

7. Body weight

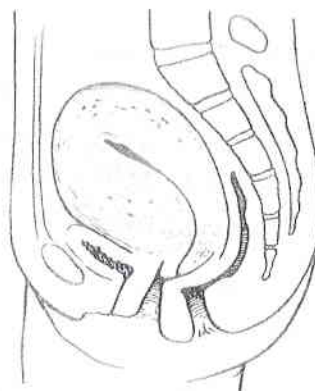
- $\downarrow$ ed during labor $\rightarrow$ expulsion of contents
- $\downarrow$ ed during puerperium $\rightarrow$ loss of fluids (polyuria & $\uparrow$ sweating)



Normal Involution



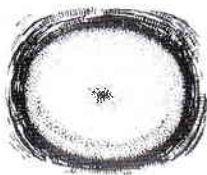
Non-gravid uterus



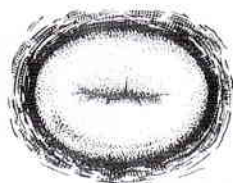
Uterus at 6th day



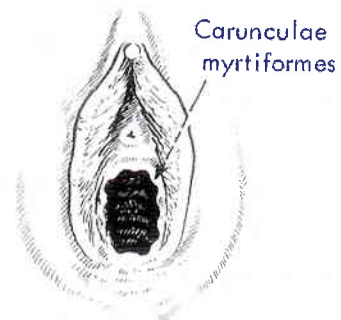
Uterus after delivery



Nulliparous cervix



Parous cervix



Carunculae myrtiformes

② Genital tract changes

1. Uterus

□ Weight

- Immediately after labor → 1000 gm
- 1 wk → 500 gm 2 wks → 250 gm
- Gradually reaches 60-80 gm → by end of 6 wks

□ Level

- Immediately after labor → at umbilicus
- 1 wk → between umb. & SP 2 wk → at SP
- Gradually reaches prepartum size (or slightly greater)

□ Structure changes

- Muscle → autolysis of excess muscle
- Vessels → obliteration → elastic fibers
- Decidua → shedding (*except basal layer*)

□ Lochia

- Discharge from genital tract after labor for 3-6 weeks
 - 10 days → red → lochia rubra } bloody
 - 5 days → pale red → lochia serosa } lochia
 - 5 days → white → lochia alba
- If becomes : bloody → 2nd PPhge / malodorous → P.sepsis
- Composed of : decidual fragments....cx mucus.....vag epith.
Blood.....fibrin.....leukocytes.....peptones

2. Ovary.....return of ovulation & menses ☼

- Non lactating → 1½ – 2 months
- Lactating → depends on degree of lactation
 - . delayed in 50% (6 months)
 - . rarely in 25% (1 year - can persist to 2 year)

3. Cervix..... Closed in 1 wk → becomes slit shaped external os

- . Physiologic ectopy may occur

4. Vagina..... Gradually decreases in size (but does not reach prepartum size)

- . Becomes smooth

5. Vulva..... Remains gaped for some time

- . Forchette & fossa navicularis disappear
- . Wounds heal well unless infected
- . Pelvic floor muscles gradually regain tone (helped by exercises)

Symptoms	Diagnosis	Special investigations	Management
Cough	Chest infection	Sputum M, C and S	Physiotherapy
Purulent sputum	Pneumonia	Chest x-ray	Antibiotics
Dyspnoea			
Sore throat	Tonsillitis	Throat swab	Antibiotics
Cervical lymphadenopathy			
Headaches	Meningitis	Lumbar puncture	Antibiotics
Neck stiffness (epidural/spinal anaesthetic)			
Dysuria	Pyelonephritis	Urine M, C and S	Antibiotics
Loin pain and tenderness			
Secondary PPH	Metritis	Pelvic ultrasound	Antibiotics
Tender bulky uterus	Retained placental		Uterine tissue
Pelvic/calf pain/tenderness	Deep vein thrombosis	Doppler/venogram of legs	Heparin
Chest pain	Pulmonary embolism	Chest x-ray and blood gases	Lung perfusion scan angiogram
Painful engorged breasts	Mastitis Abscess	Milk M, C and S	Express milk Antibiotics Incision and drainage

M, C and S, microscopy, culture and sensitivity; PPH, postpartum haemorrhage.

Subinvolution

Definition → failure / delay in returning to normal size within 6 wks

Causes

- Retained products ± infection (the commonest) ✓
- Over-distended uterus (twins...polyhydramnios)
- Congested uterus (fibroid, choriocarcinoma)
- Non lactation
- Poor general condition (anemia, APHge, PPHge)

C/P → sense of heaviness in pelvis + persistent lochia

O/E → uterus is larger & softer than normal

Comp → prolapse & retroversion

TTT → methergine or PG analogues / D&C if persistent

Puerperal pyrexia

Definition ⇨ increased T $\geq 38^{\circ}\text{C}$ on ≥ 2 occasions in the 1st 10 days after delivery (excluding the 1st 24 hours)

Causes

1- P. sepsis → ✓....the most serious	4- DVT
2- Breast → ✓....the most common (engorgement, mastitis, abscess)	5- Complication in associated genital tumor
3- Infections e.g. UTI or wound inf.	6- Lung atelectasis

Diagnosisvery case should be considered P. sepsis until proved otherwise.....

1. History

- . *Obstetric* → mode of delivery, time of ROM, difficulty, instruments
- . *Etiology* → cough, breast heaviness, dysuria, LL edema

2. Examination

- . *General* → vital data / 3 colors / chest, breast / heart / lower limbs
- . *Abdominal* → height of fundus / T, R, RT / renal angles
- . *Vaginal* → lacerations of vulva, vag, lochia, adnexal or pelvic swellings

3. Investigations

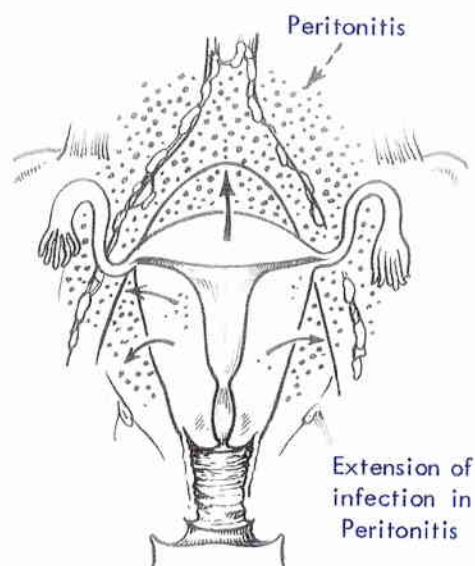
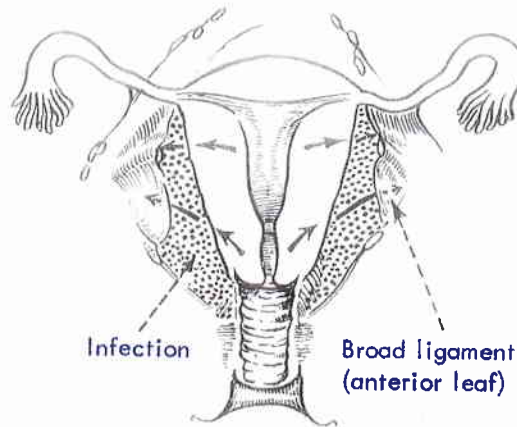
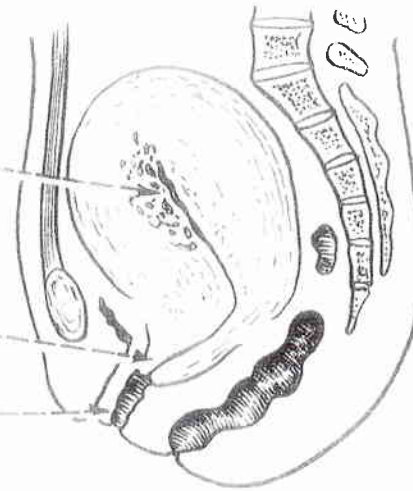
- . CBC, urine analysis
- . Cervicovaginal swab ± blood → culture

Infection may enter through one or more of these wounds :-

The PLACENTAL site is a raw wound with gaping veins occluded by thrombi - a good culture medium.

The CERVIX is nearly always torn even in normal parturition

The VAGINA is often torn, or involved in an episiotomy.





Puerperal Sepsis



Definition → infection of the genital tract following delivery

Organisms

- Gm +ve → β -hemolytic strept / staph } mainly
- Gm -ve → as E.coli } mixed
- Anaerobic → clostridium, anaerobic Strept ✓✓ } (poly-microbial)

Route

- Exogenous → e.g. droplet infection or instruments
- Endogenous → from commensals in vagina
- Autogenous → from a septic focus in patient

Pdf

- General → decreased resistance (anemia, malnutrition, hge.)
- Local → PROM, prolonged labor, ↑ interference, retained fragments

Pathology

Primary sites (endometritis):

	Localized (putrid)	Spreading (septic)
Organism	anaerobic strept.....4 th day	hemolytic strept.....2 nd day
Infection	Mild, limited by a pyogenic memb. (leucocytic barrier)	Severe, spreading with failure of localization
Uterus	large, soft	normal in size
Lochia	excessive & offensive	scanty

Secondary sites & spread:

- * Local ► salpingitis / salpingoophritis
- * Pelvic ► parametritis / pelvic peritonitis / pelvic abscess
- * Abdominal ► septic thrombophlebitis, generalized peritonitis
- * Systemic ► SIRS
 - . Acute haemolysis (esp. strep. & clostridium) ± DIC
 - . Jaundice (haemolysis or septicemia with liver affection)
 - . Renal failure due to → hypovolaemia / septic shock / haemolysis

Septicaemic shock

↳ anuria, oliguria, tachycardia, tachypnea, hypotension)

1..... first hyperthermia (warm hypotensive stage)

2..... then hypothermia (cold hypotensive)

Clinical picturemore in *septic endometritis***Symptoms**

- General ⇔ FAHM ± Rigors
- Abdominal ⇔ continuous lower abdominal pain
- Local ⇔ offensive lochia ± 2^{ty} PPH

Signs

General (Toxic, Pale, Tachycardia, Tachypnea, High fever)

Abdominal

- Lower abdominal tenderness & rigidity
- Decreased abdominal movement with respiration
- Tender uterus may be felt

Vaginal examination

- Bleeding & offensive discharge
- Cervical motion tenderness
- Tender adenexal swelling (salpingo-oophritis)

Investigations

- . TLC, ESR, CRP
- . Cervicovaginal swab
- . Urine analysis

Treatment**1. Prophylactic**

During pregnancy → correction of anemia, DM

During labor → . Proper sterilization & antiseptic technique

- . Avoid unnecessary PV examinations (4–5 PV all in all)
- . Prophylactic abts if PROM or in prolonged labor

During puerperium → isolation from infected persons

2. Active treatment□ Medical

- Isolation in a separate room
 - . Fowler position (semi-sitting) → to help drainage
 - . Light diet with plenty of fluids
 - . Analgesics & antipyretics
- Combination antibiotics intravenously in high doses
 - . Ampicillin 1g/6....garamycin 80 mg/8....Flagyl 500mg/8
 - . After 48 hours → shift to antibiotic according to C&S

□ Surgical

- Removal of uterine remnants by suction
- Posterior colpotomy for drainage of pelvic abscess

- TTT of complications e.g. heparin for septic thrombophlebitis

Breast disorders in Puerp

Contraindications of Breast Feeding

► Maternal disease

- Heart failure, chronic renal failure
- Acute illness (pneumonia) /active pulmonary TB
- Hepatitis C.....B (except if the newborn received Ig vaccine)

► Disease of the breast

- Mastitis or abscess
- Marked cracking & fissuring
- Retraction of the nipples

► Fetal Conditions

- Marked prematurity.....fetal death✓✓
- CFMF which interfere with suckling → harelip / cleft palate

Suppression of Lactation ☠

- ✓✓ Tight breast binders + no suctioning of breasts.....if failed ✓
- Bromocriptine (parlodel).....2.5 mg 1x 2x 14
- Lisuride (dopergine).....0.2 mg 1x 2x 14
- Vit. B₆ (pyridoxine → synthesis of dopamine).....100 mg 1x 3x 5
- ✕✕ Oral estrogen (Ethinyl Estradiol) → danger of thrombosis

Deficient Lactation

► Etiology

- .*Maternal* → ill health, poor nutrition, Sheehan syndrome
- .*Local* → poor development / inflammation of breast
- .*Fetal* → failure of the baby to suckle efficiently

► Management

- Ample fluids (at least 3 L daily) + adequate diet
- Regular breast feeding from both sides
- Any remaining milk should be evacuated by pump or manually

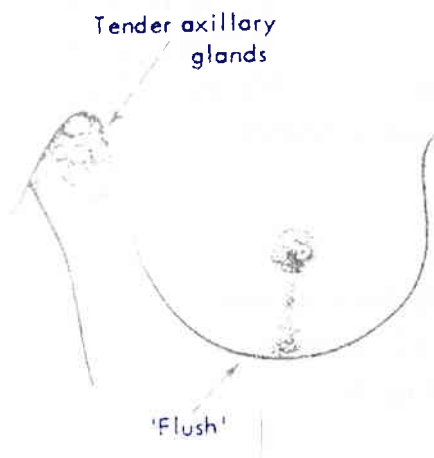
Cracked (fissured) nipples

► Complication

Pain → milk retention → abscess

► Treatment

1. Use nipple shield during feeding to prevent further injury
2. Apply panthenol cream
3. If these measures failed
 - Regular emptying by manual compression or by a suction pump
 - Avoid lactation from this breast until fissures are completely healed



Breast Engorgement

► Etiology

- It occurs on 3rd or 4th day after delivery when milk secretion starts[■]
- It is due to obstruction of the mammary ducts with coagulated milk or absence of the milk ejection reflex → distension of alveoli with milk → obstruction of lymphatics & veins

► Symptoms

- Malaise & P. pyrexia (temp. rarely exceeds 38.5°C)
- Breasts become enlarged, engorged, painful and tender

► Treatment

1. Support the breasts with a tight binder or brassiere
2. Analgesics & hot fomentation to ↓ pain & congestion
3. Regular evacuation of the breast by massage or a pump[■]
4. Oxytocin (to help milk flow[■]) → nasal spray or sublingually

Acute Mastitis & Breast Abscess

► Causative Organisms

Causative organisms → staph. aureus✓[■], streptococci, E.coli

Source of infection → the infant nose or throat[■]

Route of infection → through fissures or abrasions at time of feeding

► Types

1. Non-epidemic form.....at early weeks or at weaning
2. Epidemic form.....2-4 days after delivery (d.t. outbreak in the nursery)

► Forms of Mastitis

- . If limited to the areola.....subareolar abscess
- . If spreading along the duct system.....parenchymatous mastitis
- . If spreading along lymphatics.....interstitial mastitis
- . If spreading to areolar tissue under breast.....retro-mammary abscess
- . Rarely.....subcutaneous abscess

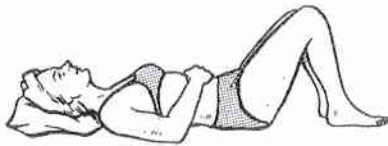
► Clinical Picture

- * FAHM-R
- * The breast is enlarged, tender, warm & red
- * If an abscess forms → there is edema of the skin fluctuation
- * The axillary LNs are enlarged and tender

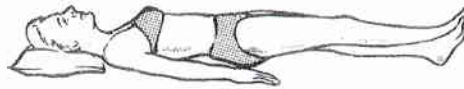
► Treatment (as in engorgement 1, 2, 3 +)

- Antibiotics (after taking a sample of milk[■] or pus for C&S)
- If abscess is formed → . Incision & drainage
 - . Stop breast feeding from the affected side

POSTNATAL EXERCISES



Patient's hands press on abdominal muscles. First, thoracic breathing is done, then abdominal.



Both knees straight and legs crossed, buttocks and thighs are contracted and relaxed. Anus and perineum are drawn in as if trying to prevent micturition.



Lying on back with knees bent, rock abdomen and buttocks backward. Forward rocking aggravates sacro-iliac discomfort.



Sitting in a chair, slowly bend forward to touch toes, and slowly sit up and straighten shoulders.



Postnatal care



1. Observations

- Pulse, temperature → every 4 hours for 24 hours then twice daily
- Fundus → palpated daily to check for normal involution
- Lochia → checked daily to note the amount, color, odor
- Hb % → done next day after delivery to exclude anemia
- Signs of depression (postpartum blues) due to stress of labor
- DVT → tenderness or swelling in the thigh or calf
- The fetus → for jaundice & condition of the umbilical stump

2. Vulva & Vagina (prevent infection)

- Strict asepsis → wash vulva with antiseptic (no vaginal douches)
- Swab perineal wounds

3. Bladder

- Encourage repeated voiding to regain tone & to ↓ RVF uterus
- Any patient catheterized during labor → mid-stream urine for C&S

4. Bowels

- Avoid constipation (fluids & diet rich in fibers as vegetables)
- Glycerin suppositories may be used (± enema on 3rd morning)
- Treat piles by suppositories or local anesthetic ointment for pain

5. Breast care

- Inspected daily for cracking of nipples, inflammation or engorgement
- Wash with warm water (or boric lotion) before and after each feeding
- Encourage feeding → 5-10 min/breast every 3 hrs
- Good diet

6. Diet

- Ample fluids
- Good nutrition (↑ proteins & vitamins)

7. Rest

- Encourage early ambulation → ↓ retention of urine, constipation, DVT
- Rest in 1st week with →
 - . some rest on abdomen to prevent RVF
 - . semi-sitting position to help drainage of lochia

8. Postnatal exercises

- Pelvic floor exercises → on 3rd day (if no episiotomy). The patient is asked to contract & relax the pelvic floor 3 times to be increased gradually
- Abdominal muscles exercises → after one week

9. Pain relief

- Analgesics (oral or suppositories)
- Afterpains → lower abdominal cramps due to uterine contractions.
They also occur during breast feeding d.t. oxytocin release

10. Immunization ☠

► During pregnancy

* **Contraindicated** → (Live Attenuated) MMR, yellow fever

* **Not contraindicated**

- *Inactivated*
 - . Virus → influenza, rabies, poliomyelitis (salk, sabine)
 - . Bacteria → cholera, typhoid, plague, meningo-coccus
- *Toxoids*
 - . Tetanus } toxins are treated to destroy their toxicity
 - . Diphtheria } but still capable of producing antibodies
- *Immune globulins*
 - . Hepatitis A & B
 - . Measles / Varicella
 - . Tetanus
 - . Rabies

► After labor

- *Anti-D Ig* → for nonimmunized Rh-ve mothers
- *Hepatitis B +ve mothers* → the infant receives both vaccine & immune globulin (0.5 ml IM)
- *Rubella vaccine* → for non-immunized women (avoid preg. for 3 ms as it is a live attenuated vaccine)

11. Education

- Instructions for self-care of the mother & her baby
- Advantages of breast-feeding are explained to the parents
- The method of contraception is discussed
- Coitus can be started within 3 weeks
- Visitors → avoid contact with infected persons or carriers

12. Discharge → if no complications → discharge after 24–48 hours

13. Postnatal visit (after 4 weeks)

- **History** → vaginal bleeding or discharge, breast disorders, UTI
- **Examination** → episiotomy wound, uterine size
- **Management of problems** → prolapse, SUI, puerperal RVF



Maternal mortality rate



Definition *The death of any woman d.t. any cause (in preg. & puerp.)[□]
 Regardless the duration or site of pregnancy
 From any cause related or aggravated by preg. or its management
 But not from accidental or incidental causes*

Indices used

$$\text{MMR} = \frac{\text{number of maternal death in one year}}{\text{number of total births in the same year}} \times 100.000$$

* It is about 140 /100.000 in Egypt [□] **recently.....75/100.000**

* Less in developed countries (8 in USA, UK) !!

Etiology

- The major catastrophes ^{□ □ □}

- ①. PPhge.....35% (previously sepsis was considered one of the major causes of MMR.
- ②. PET.....22% Now, with the development of
- ③. Heart dis....13% good antibiotics.....it ↓ to...8%)
- ④. Anemia.....11%

- Others

- . DVT & pulmonary embolism
- . Complications of anesthesia
- . Obstructed labor, ruptured ectopic

Factors affecting MMR [□]

- ▶ Age → less than 20.....more than 30
- ▶ Parity → GMP
- ▶ Social class → low
- ▶ Pregnancy care → more for those not receiving good ANC
- ▶ Labor care → mode & place of delivery

Reduction of MMR

- ▶ Good antenatal care
 - Proper history taking, examination, investigation.....
 - Early detection & management of problems.....
 - HRP are either hospitalized (conservation) or terminated
- ▶ Good intranatal care
 - Proper management of labor 1st, 2nd, 3rd stages.....
 - Early detection & management of PPHge.....
- ▶ Good postnatal care
 - Prevention of puerperal sepsis
 - Prevention of DVT

Chapter

5

Operative

Induction of abortion

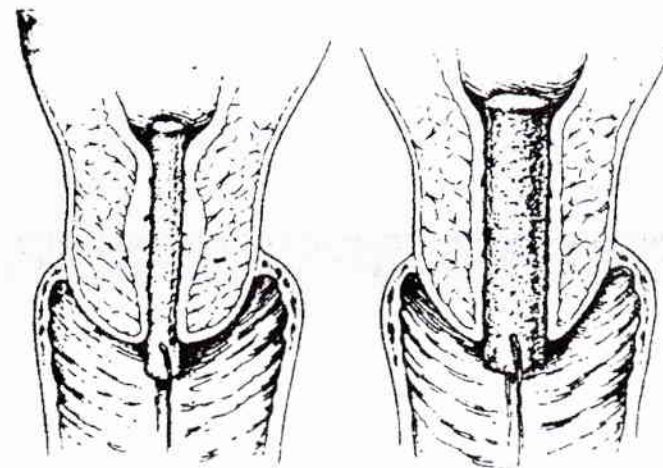
Induction of Laboor

Episiotomy

Cesarean Section

Forceps

Anesthesia



A

B

Laminaria tents

History

UREA INSTILLATION



TERMINATION OF PREGNANCY :-

① Induction of abortion

► Therapeutic abortion TOP < age of fetal viability for a medical indication

► Indications

① Maternal

- Medical disorders e.g.
 - Advanced:- Heart disease / chronic HTN / renal disease
 - Active pulmonary T.B./ severe hyperemesis
- Malignancy
 - Genital tract / breast malignancy
 - Chemotherapy or radiotherapy
- Mental psychological illness

② Fetal

- Missed abortion / blighted ovum
- Vesicular mole
- Exposure to teratogenic agents → rubella radiation

► Methods

A- Before 14 weeks → suction evacuation Or dilatation & curettage

B- After 14 weeks

- Prostaglandins
 - Local (intra-amniotic or extra-amniotic)
 - Vaginal or intracervical tablets
- Oxytocin
- Hysterotomy if all fail or there is severe bleeding

⌘ Old method ➡ Intra-amniotic injection of hypertonic solution ~~XX~~

- Saline 20%.....Urea 40%.....Glucose 50%
- Comp. → danger of infection & DIC (thromboplastin)

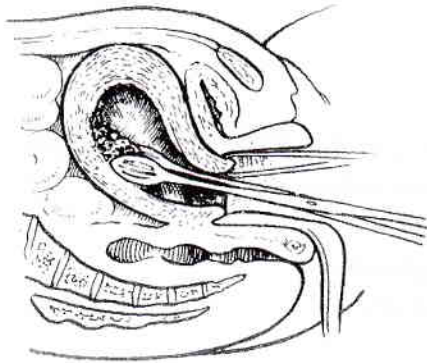
⌘ Pre-operative ➡ Laminaria tents

- Dried stem of special seaweed (Laminaria Japonica) e.g. Dilapan
- Placed in the cx → absorbs water (hygroscopic) → swells 5x
- It is left for 12 – 14 hours to aid in cervical dilatation

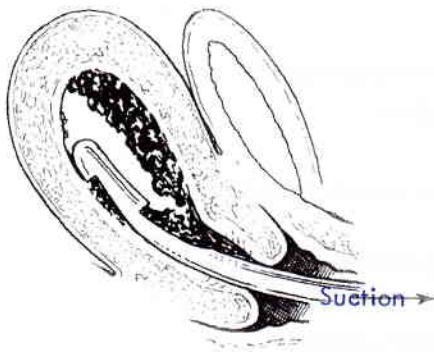
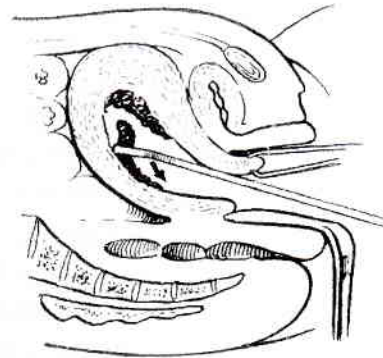
⌘ Medical abortion ➡ Mifepristone (RU-486) 200 – 600 mg

- They block progesterone receptors & ↓ their synthesis
- Better success in 1st > 2nd trimester
- Better to be combined (Mifepristone + Mesopristone + Methotrexate)

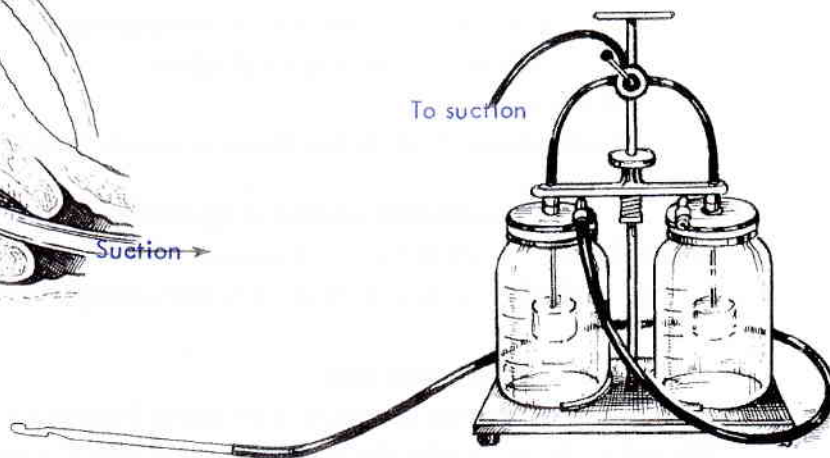
ring forceps



Curette



To suction



Technique of vaginal evacuation

-**Anesthesia** ⇨ GEA or paracervical block
-**Sterilization**, catheterization, toweling
-**Position** ⇨ lithotomy
-**Examination** ⇨ bimanually to exclude any abnormality

- 1- **Insert Auvard** self retaining posterior vaginal wall speculum
 - Catch cervix with volsellum or ring forceps
 - Uterine sound to know length of uterus
 - Gradual dilatation of cervix
 - 2- **Insert ring (or ovum) forceps** closed inside the uterus
 - Open to catch the products of conception then rotate 90° so that you are sure the uterine wall is not grasped
 - Curettage by a sharp curette to remove decidua
 - Ergometrine is given → avoid bleeding & perforation
-**Examine the products** & send them to histopathology ± anti-D

*** Complications of vaginal evacuation**

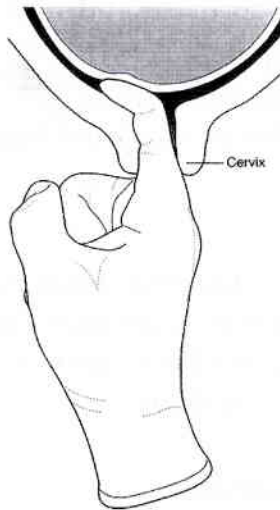
- Anesthesia complications
- Hemorrhage:
 - Cervical lacerations
 - Uterine perforation
 - Retained products
 - Uterine atony
- Infection → Asherman syndrome
- Injury - Incompetent cervix
 - Uterine perforation
 - Bladder or intestinal injury

In suction evacuation

- Instead of introduction of the ring forceps → introduce suction cannula (Karman cannula) inside the uterus to remove products of conception
- Then sharp curettage may be done

*** Advantages of suction**

- Short time ∴ less anesthesia
- Less trauma (less likely to perforate the uterus)
- Less bleeding



2 Induction of labor

► Definition

TOP by *initiation of uterine contractions* after the age of fetal viability

NB Augmentation of labor is the artificial stimulation of labor which
 ↳ *has already begun*

► Indications (*when benefits to M. or F. outweighs continuing preg*)

Maternal	Fetal
- Preeclampsia	- IUGR (placental insufficiency)
- Eclampsia	- IUFD
- Chronic hypertension	- Postmaturity ✓✓
- Chronic renal disease	- Polyhydramnios
- DM	- PROM > 34 wks
- Some cases of APHge	- CFMF (major type)

► Bishop score

- Assessment of the cervical state to determine the inducibility
- Used for all patients (although designed 1st for MP only)
- Score > 8 ⇔ inducible
- Score < 8 ⇔ liable more to failed induction, prolonged labor, CS.

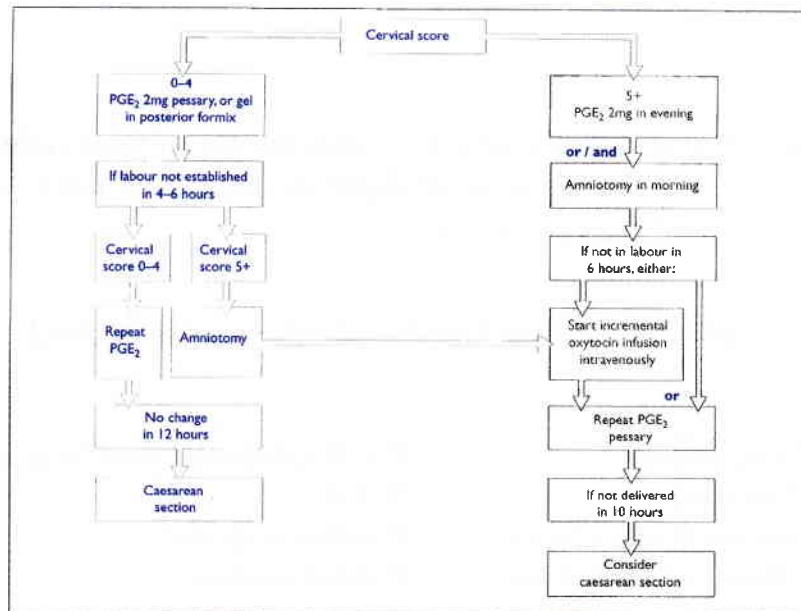
This could be improved by using PG analogues 1st
 to increase cervical ripening

	0	1	2	3
- Dilatation	Closed	1-2	3-4	≥ 5
- Effacement	0-30%	40-50%	60-70%	≥ 80%
- Station	- 3	- 2	- 1, 0	+1, 2
- Consistency	Firm	Medium	Soft	
- Position	Posterior	Middle	Anterior	

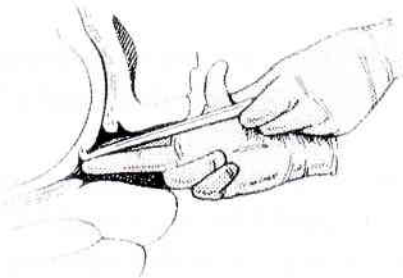
► Methods

1) Stripping of the membranes

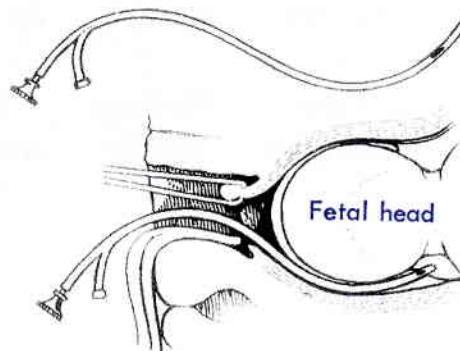
- The index finger separates the fetal membranes from the cervix & the LUS → release of prostaglandins
- Disadv → infection & ROM



1. Forewater Amniotomy



2. Hindwater Amniotomy



2) Medical

↪ *Oxytocin infusion* *more in term pregnancy*

5–10 units in 500 ml saline (better → to avoid H₂O intoxication of glucose). Given slowly by drip 0.5–2 mIU /min with incremental increases of 1–2 mIU /min every 30–60 min till adequate response (3–5 contractions /10 min each lasting 40–60s)

- During induction → intrapartum fetal monitoring
- Better to do amniotomy before oxytocin drip (to avoid AF embolism)

↪ *PG* (more potent but less safe) *more in earlier pregnancy*

- PG E₂ (dinoprostone)
 - . Prostin
 - . Cervidil
- PGE₁ (misoprostone ✓) cheaper, given vaginal or oral

3) Surgical (Artificial rupture of membranes (AROM) = amniotomy)

* Rupture of forewaters

Without anesthesia → introduce finger in cervical canal to separate the bag of forewaters from presenting part → rupture the membranes by amniotomy hook or Kocher forceps (or even finger)

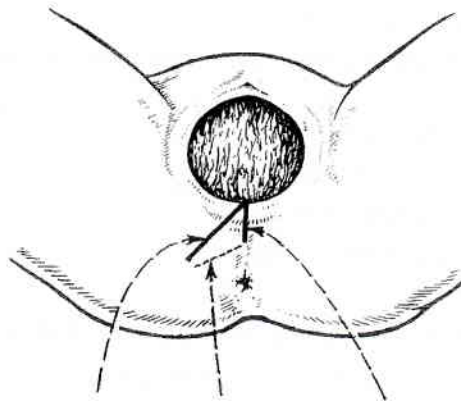
- Advantages → easy & most done
- Disadvantages →
 - Infection
 - Prolapse of cord
 - Bag of forewaters may help dilatation of cervix
 - Sudden drainage of liquor may lead to → accidental hge.

* Rupture of hindwater (rarely done)

- Under general anesthesia by → Drew Smythe catheter
- Disadvantages →
 - Difficult, anesthesia
 - May injure uterus, fetus, placenta or cord
- Advantages →
 - Less infection
 - No cord prolapse
 - Bag of forewaters intact
 - Slow drainage of liquor

- Usually after AROM → uterine contractions will start
- If not started within 1 hour → oxytocin drip

4) Combined medical & surgical induction may be done



Episiotomy

► **Definition** ⇨ incision of the perineum to widen the introitus (vaginal orifice)

► **Indications**

- If perineum is about to tear d.t.
 - * OVERSTRETCH → large head, narrow introitus
 - * RAPID STRETCH → PPT labor, after coming head of br.
 - * CONDITIONS → edema, scar, rigid perineum (elderly PG)
- < Obst. procedures (forceps.....destructive operations....ventouse)
- > Gyn. procedures (prolapse....complete perineal tear.....RVF)

► **Types**

1. **Median** (midline)

□ *Advantages:* □

- ✓- Good widening
- ✓- Less hemorrhage
- ✓- Easy to perform & to repair
- ✓- Less painful

□ *Disadvantage:*

- ✓- If it extends downwards → complete perineal tear

2. **Mediolateral**

□ *Advantages*

- ✓ - Less liable to complete perineal tear □

□ *Disadvantages*

- ✓ - More hemorrhage
- ✓ - More difficult to repair
- ✓ - More liable to leave painful scar

3. **Lateral episiotomy** X

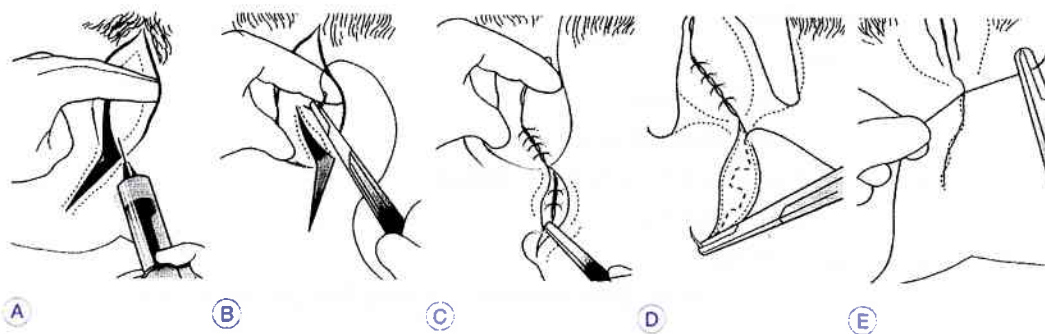
Not done as it gives poor widening, excessive bleeding & may injure *Bartholin gland* or duct

4. **J-shaped episiotomy**

This is extension of a median episiotomy mediolaterally to avoid possible extension to the rectum & anal sphincter

5. **Schuchardt incision**

This is an incision around the anal canal to produce maximum widening of the introitus. Some may do it early to avoid excess stretch of the perineum



Repair of a perineal tear or episiotomy (see text).

► Advantages of episiotomy [□]

- Prevents perineal tear → more anatomical injury so easier to repair
- Shortens the 2nd stage → ∴ less compression
 - . on perineum → ↓ prolapse & SUI
 - . on head (esp PTL & breech) → ↓ ICHge
- Usually done with local infiltration, pudendal n. block

*In 70's episiotomy was done routinely for about 90% of cases. There were 2 main reasons for episiotomy (one was PG and the other is previous episiotomy). Recently, these high rates were **reduced** to about 10 – 50 % (international variation). It is not indicated routine for PG or absolutely contraindicated in MG; it is simply indicated whenever the perineum is ABOUT TO TEAR*

► Complications

- Pain (interfere with sitting & → reflex retention of urine)
- Hge ± hematoma formation (in vulva, vagina, ischiorectal fossa)
- Infection → fibrosis → dyspareunia
- Breakdown of episiotomy due to:
 - Infection
 - Bad repair
 - ↑ tension of sutures used
 - Bad healing power

► Repair ■ as 2nd perineal tear

Technique

- Local infiltration or under GEA
- All sutures are *interrupted* chromic catgut (or better Vicryl)
 - . Deep perineal muscles
 - . Vaginal wall → continuous or interrupted stitches
 - . Superficial perineal muscles & then → perineal skin closure

Post-operative

- Local cleanliness & dryness
- Perineum ⇌ antiseptic as betadine (povidone iodine)

Notes

3 Cesarean section

► Definition

TOP after age of viability through both *abdominal & uterine* incisions

- Before fetal viability ⇔ HYSTEROTOMY
- Abdominal pregnancy or after rupture uterus ⇔ LAPAROTOMY

► Incidence (variable) → (3-5%) at 1960 (20-25%) at 1990 [°] d.t.)

- Repeat CS ✓✓ --- malpractice
- CPD (dystocia) --- more diagnosed (partogram)
- Breech --- is managed directly by CS
- Patient request ✓✓ !!!!

► Indications

□ Pregnancy

- Antepartum hemorrhage (placenta previa)
- Brevious baby (long period of infertility, or elderly PG) 
- Continuation of pregnancy is hazardous on M or F (e.g. severe PET)
- Diabetes mellitus (if macrosomia or previous unexplained IUFD)

□ Labor

- Passenger ⇔
 - . Bony → CPD (2nd ° or failed trial of labor)
 - . Soft tissue → tumors, cervical rigidity, vaginal stenosis
- Power ⇔
 - . Abnormal uterine action & 2^{ty} arrest of labor
 - . Maternal distress < full cervical dilatation
- Passenger ⇔
 - . Malpresentations (breech, Tr., Brow, face, some OP)
 - . Macrosomia
 - . Fetal distress < full ex dilatation, e.g. IUGR, prolapsed pulsating cord

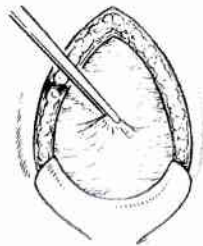
□ Previous obstetric operation (CS) ✓✓✓ if →

- More than 1 LSCS
- Previous 1 USCS or 1 hysterotomy
- Previous repair of rupture uterus
- Previous perforation of uterus

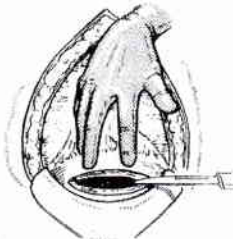
□ Previous gynecological operations

- Repair of Vesico-vaginal fistula
- Repair of SUI
- Fothergill operation
- Sometimes after myomectomy

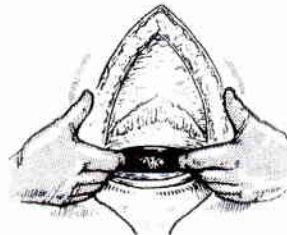
TECHNIQUE OF LOWER SEGMENT SECTION



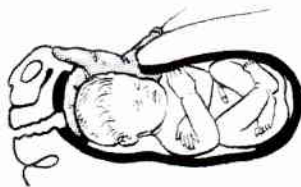
Pelvic contents are packed off, and the loose uterovesical peritoneum picked up.



Peritoneum is cut to expose lower segment, and a small transverse incision is made.



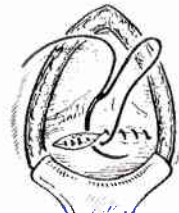
The uterine incision is widened with the fingers.



The operator's right hand is pressed into the uterus to lift the baby's head, while the assistant presses on the fundus to push the baby out. A single forceps blade instead of the hand may be used.



Sometimes it is necessary to extract the head with forceps.



The placenta is delivered as before, and ergometrine given. The uterine wound is closed with 2 layers of No. 2 catgut. A suction drain in the abdominal wall is advantageous.

History

Gaius Julius Caesar (100–44 BC). The name 'caesarean section' is probably derived from a Roman legal code called 'Lex Caesarea', which allegedly contained a law prescribing that the baby be cut out of its mother's womb in the case that she dies before giving birth. Caesar himself was not delivered this way.

History

The Pfannestell incision is a curved suprapubic incision described by Herman Johannes Pfannestell in 1900. It is lower than the Joel Cohen incision, which is 3 cm below a line joining the anterior superior iliac spines.

► **Indications for CS may be**

- *Absolute* (no other alternative) → severe CPD, P. praevia centralis
- *Relative* (vaginal delivery may take place but CS is safer)

► **Contraindications** relative (none absolute[Ⓜ]) →

- Fetal death, Major malformations
- Cardiac, coagulopathy

► **Timing of operation**

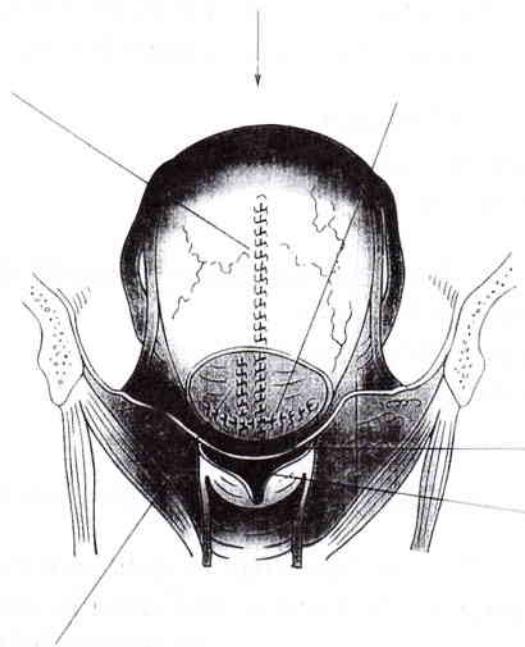
- *Elective* (planned) → before the onset of labor pains
- *Selective* (emergency) → during labor

► **Types of operations**

1. Upper segment CS (Classical)
2. Lower segment CS (Best)
3. Extraperitoneal CS → type of LSCS but the peritoneum is not opened

❧ Technique of LSCS ❧

- **Anesthesia** → General or spinal or epidural (best)
Local infiltration in heart failure[Ⓜ]
- **Catheterization** of bladder
 - FHS are heard (DON'T MISS THIS !)
 - Sterilization
- **Skin incision**: Transverse suprapubic (Pfannenstiel)
 - Separate recti muscles
 - Open parietal peritoneum
 - Centralize the uterus
- **Bladder is retracted** by Doyen retractor
 - Incise the lower segment ⇄ transversely (C-shaped incision)
- **Deliver the fetus**. The head may be delivered by
 - Scooping by the hand ✓ (the hand is introduced below the head & push it upwards helped by fundal pressure)
 - By one blade of short forceps (Simpson or better Wrigley)
 - Deliver the placenta
- **Closure of uterine incision** in 2 layers (3 in USCS)
 - Peritoneum is closed as a separate layer
 - Close abdomen & remove any blood clots in the vagina
 - Catheter is removed whenever the patient is ambulant



Vertical LSCS

- **Advantages** ⇨ Less:
 - ↓ Hge (midline is less vascular)
 - ↓ Liable to injure vessels & ureter
- **Disadvantages** ⇨ may extend downwards to bladder or vagina
- **Indication** ⇨ constriction ring

USCS- Classical

- **Advantages** ⇨ easy, takes shorter time
- **Indications** ⇨ difficulty to perform or reach LS e.g.
 - *Fibroids, varicose veins* [⌘]
 - *Impacted shoulder, obstructed labor* [⌘]
 - *Dense fibrosis (previous repair of V-V fistula)*

Cesarean hysterectomy [⌘]

- *Uncontrolled PPhg* (atonic, rupture, morbid adherence of placenta)
- *Severe infection* (failed to control, old age, MP)
- *Multiple fibroid* in old patient completed her family (rare)

► Complications of CS

☆ Operative

- Anesthetic complications → Mendelson syndrome
- Hge (1^{ry}) → shock
- Injury → urinary bladder or ureter
- Neonate ⇨ more liability to HMD ??

☆ Postoperative

- Thrombosis & embolism
- Pulmonary complications → bronchitis, pneumonia
- Intestine → paralytic ileus, adhesions, intestinal obstruction
- Urinary tract → infection, retention of urine, fistula
- Genital → endometritis, parametritis
- Wound → infection, burst abdomen, rupture scar in next pregn.

☆ Mortality < 0.1%

- Mainly d.t. (①Anesthetic comp....②Hge, DVT....③Severe sepsis)
- ↓ d.t. improvement in (anesth.....blood banking.....antibiotics)

Although improved, however still [⌘]

** Mortality is 20 / 100.000 (as compared to 2.5 in VD)

** Morbidity is 8 – 12 x higher (as compared to VD)



► Advantages of LS over US cesarean section

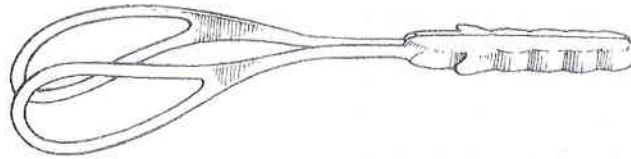
LSCS 	USCS 
1) Hemorrhage is less - LUS is thin & less vascular - Incision is away from placental site	More liable
2) Rupture is less (0.2 – 0.4 %) - Easier to coapt the edges - Haemostasis more easy - Muscle is relaxed during puerperium - Placenta will be away next preg.	More liable (2– 4%)
3) Infection is more localized (as perit. is closed as a separate layer)	More liable ^{□ □}
4) Paralytic ileus is less (as intestines are less manipulated)	More liable
5) Postoperative adhesions is less (wound is low & covered with peritoneum)	More liable
6) Mortality rate is less	Slightly higher

► Conditions to be fulfilled for V.BAC

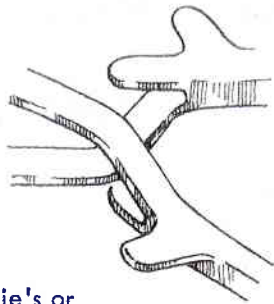
- **Previous CS.....should be reliable** ✓✓ [□]
 - One LSCS (Not USCS)
 - **No** permanent indication → e.g. contracted pelvis
 - **No** associated indication → e.g. malpresentation or placenta previa
 - **No** tenderness over scar → also scar doesn't look ugly
 - **No** previous op. difficulty → no bl. transfusion, bladder injury, p.sepsis
- **Presents by vertex**, Single fetus, Engaged head
- **During 1st stage observe for** ⇌
 - Maternal pulse, BP
 - Uterine contractions, fetal distress
 - Intrapartum hge.
- **During 2nd stage** ⇌ better to do forceps or ventouse when head is low
- **The use of oxytocin or epidural anesth.** is not absolutely contraindicated

Because > 25% of CS are repeated procedures.....
 VBAC should be offered for all who delivered by non-classical CS....
 To take the adv of less M&M....and less hospital stay
 With success ranging 60–70 % (for non-recurrent indication)

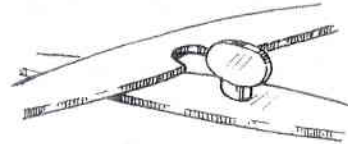
A forceps consists of two arms which can be articulated.



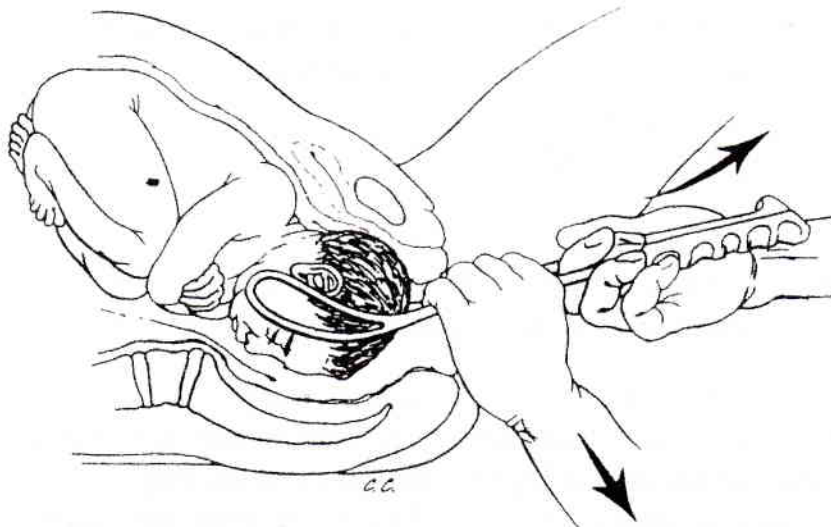
There are several kinds of lock:-



Smellie's or
English lock



French
lock



The Obstetric Forceps

.....An instrument used for delivery of a living, non-mutilated fetus (15")..... ☺

Parts of forceps

1) Blade proper (7.5 inches)

The distance between the tips of blades is 1" while at the center 3.5"

- **Fenestrated** → . To ↓ weight of blade
 - . To minimize compression of head
 - . To obtain better grip (parietal bone bulge through it)
- **Two curves**
 - *Cephalic curve* → to fit on fetal head
 - *Pelvic curve* (only present in curved forceps) → to fit to the concavity of the sacrum

2) Shank

- Different length according to type of forceps (2.5" in long forceps)
- To allow locking of the blades outside the vagina

3) Lock → different types

- **Double slot lock**.....**English lock**
 - Easy articulation
 - Minimal compression
- **Screw lock**.....**French lock**
 - Firm grip
 - More compression
- **Combined double slot lock with screw lock**.....**German**

4) Handles

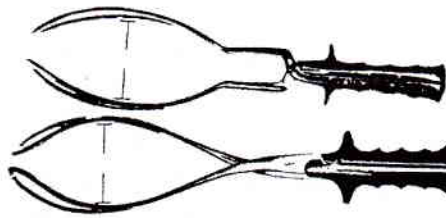
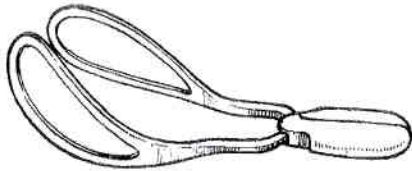
- Different lengths according to type of forceps (5" in long forceps)
- May be serrated or smooth
- For application & traction

5) Axis traction piece (rarely used now)

- **Neville** → attached to handle
- **Milne-Murray** → attached to *outer* aspects of blades
- **Tarnier** → attached to *inner* aspects of blades

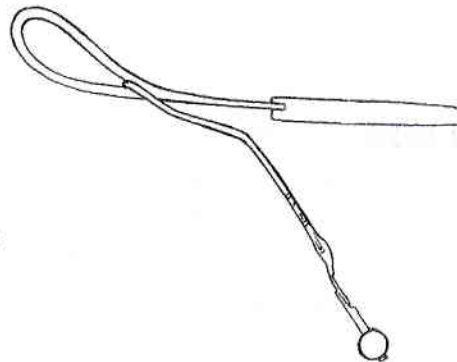
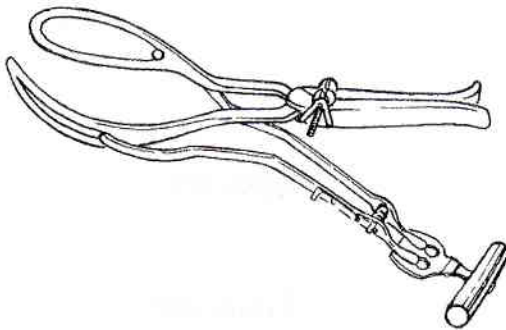
Now if more downward force is required → do **Pajot's** technique by applying downward pressure on the shank with left hand while applying traction with the right hand

Wrigley's Forceps

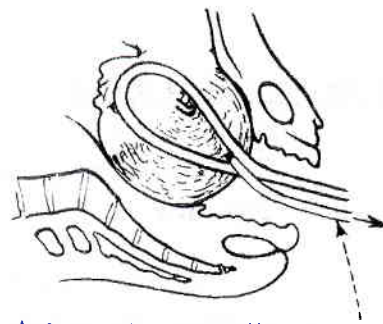
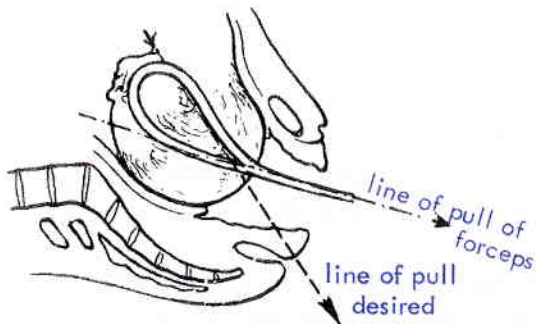


Simpson

Elliot



Milne Murray's Axis Traction Forceps



Axis traction rod pulling in axis of pelvic curve.

Types



Short



* **Straight (Simpson):** For

- Low forceps extraction
- Delivery of head at CS

* **Curved (Wrigley):** For

- Low forceps extraction (better than Simpson)



Long



↳ **Neville-Simpson-Barnes forceps** ✓

(most used; the long curved forceps)

- Axis traction piece fixed to handle
- Notch between shank & lock
- Serrations on handle
- English lock (double-slot lock)
 - NEVILLE-SIMPSON FORCEPS
 - Serrated handle
 - No notch
 - BARNES FORCEPS
 - Notch on shank
 - No serrations on handle

↳ **Milne-Murray forceps**

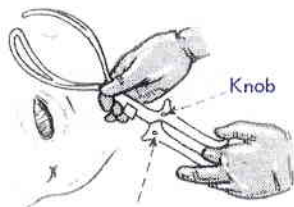
- Axis traction piece fixed to blades from *outer* aspect
- No notch between shank & lock
- No serrations on handle
- German lock (double-slot lock with screw)

↳ **Tarnier forceps**

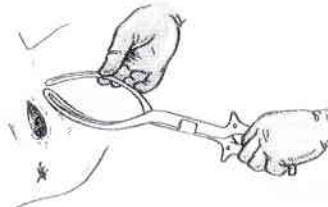
- Axis traction piece fixed to blades from *inner* aspect
- Notch between shank & lock
- No serrations on handle
- French lock (screw lock)

↳ **Special types**

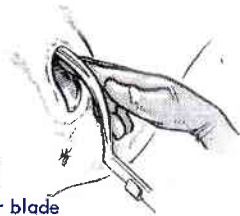




1. Holding forceps with the knobs directed towards fetal occiput.

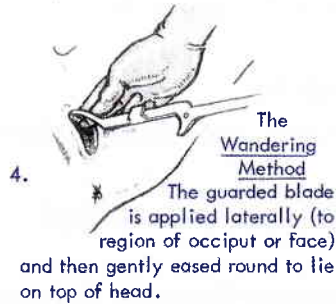


2. The anterior blade must be applied first.



3. The Direct Method

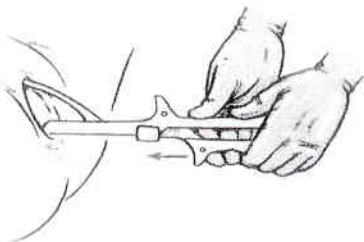
The anterior blade is guarded by the finger and slipped into the 'correct position' (see 5) on the side of the head



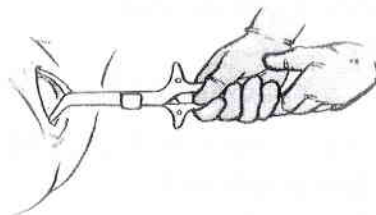
4.

The Wandering Method

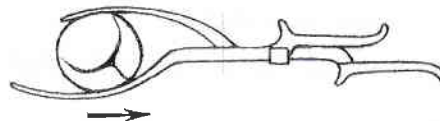
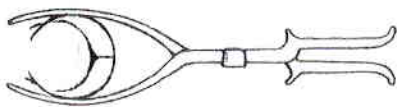
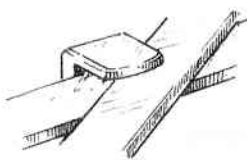
The guarded blade is applied laterally (to region of occiput or face) and then gently eased round to lie on top of head.



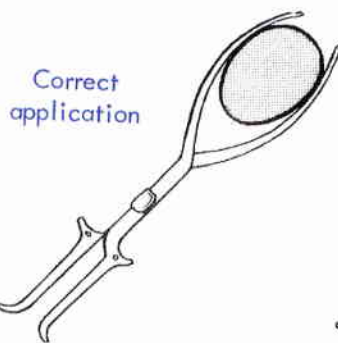
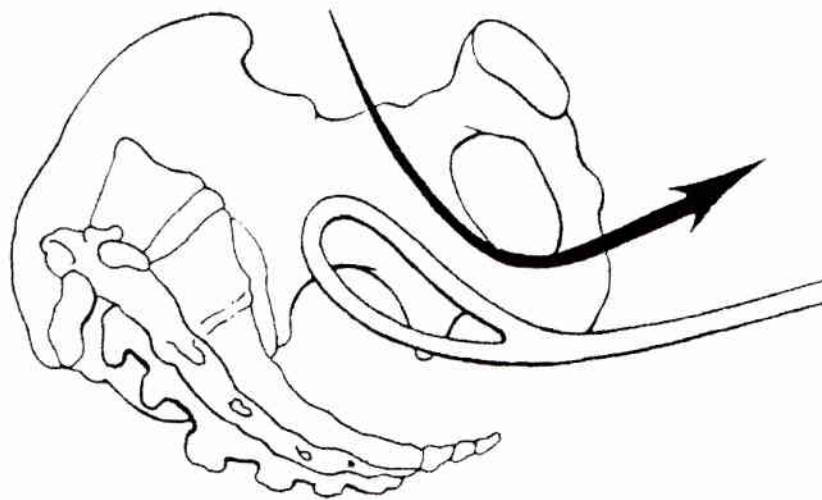
5. The forceps are locked. Note how their position shows asynclitism.



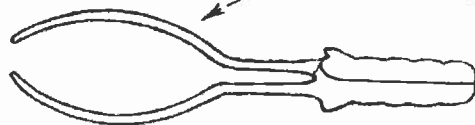
6. Asynclitism is corrected and the forceps blades are opposite each other.



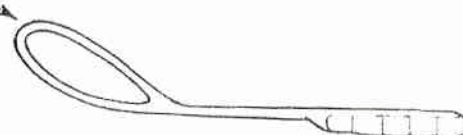
7. The head is gently rotated to the OA position. Varying asynclitism and gentle traction help to rotate into the pelvic axis. A large episiotomy is needed.



The blades have two curves.



The cephalic curve is adapted to provide a good application to the fetal head.



The pelvic curve allows the blades to fit in with the curve of the birth canal.

Actions of forceps

1) Traction (the main action)

- Should be applied in the direction of the pelvic axis → i.e:
Downwards & backwards then downward & forwards
- The force allowed is that of the UN-AIDED forearm

2) Rotation (in malrotated head) i.e. DTA, POP, PMP

- *Scanzoni double application* → very damaging to the maternal soft tissue & fetus
- *Key in lock method* → the forceps is applied (pelvic application) & then rotated a small arc → then removed & reapplied with another small rotation. This is repeated till rotation is complete
- *Kielland forceps* → the best

3) Compression

- Slight compression is applied to allow firm grip on the head
- If severe compression occurs → there is a danger of ICH (as there will be excessive compensatory increase in the vertical diameter of the head)

4) Vectis action (scooping during CS)

- May use one blade to deliver head at CS
- Sometimes may use one blade in vaginal delivery

✗ Lever action → should be avoided as it may injure the mother & fetus

✗ Stimulation of uterine contractions → reflex due to pressure on pelvic floor

✗ Dilatation of cervix? → should never be applied to the incompletely dilated cx

Types of forceps application

Cephalic

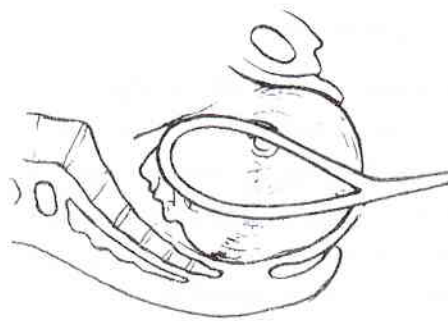
- The forceps is applied on both sides of the head to grasp BPD
- Safe to fetus but more liable to cause maternal injury

Pelvic

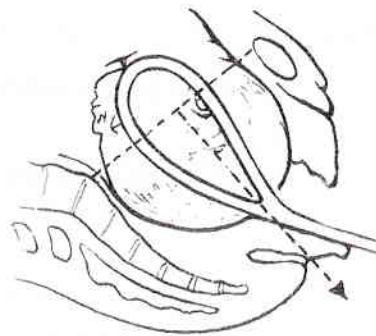
- The forceps is applied correctly regarding maternal pelvis
- If not correctly applied to fetus → may cause injury

Cephalo-pelvic (best & safest application)

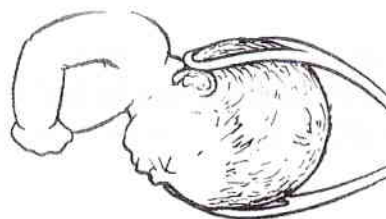
- Here the position is direct occipitoanterior or direct occipitoposterior and the forceps is applied correctly regarding both mother & fetus



Low Forceps



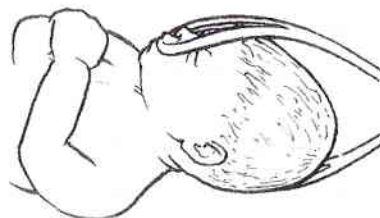
Mid Forceps



**improper
applications**



fetal injury



Types of forceps operation

⇒ High forceps XXX

- The head is not engaged → very dangerous & should never be done

⇒ Mid forceps

- The head is engaged but has not yet reached pelvic floor (above +2)
- May use the Pajot's maneuver to assist traction

⇒ Low forceps

- The head is at / below the pelvic floor (below +2)
- Sagittal suture is in the AP diameter (or in the oblique diameter $\leq 45^\circ$)

⇒ Outlet forceps

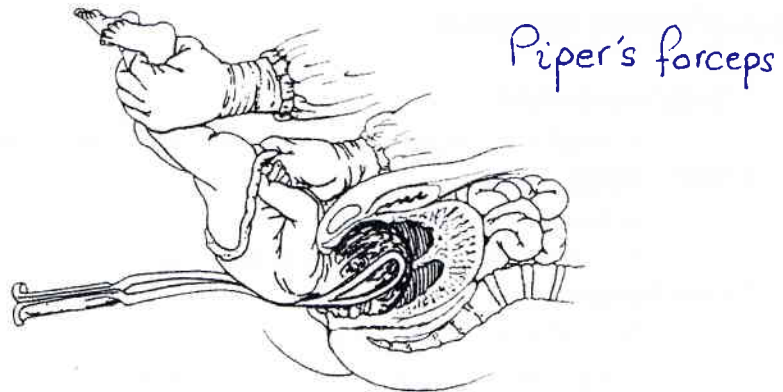
- The head is at the pelvic outlet (on perineum)...no need to separate labia
- Sagittal suture is in the AP diameter (or in the oblique diameter $\leq 45^\circ$)
- The easiest & safest forceps delivery.....Wrigley forceps

Indication of forceps delivery ⇒ ΦΦ

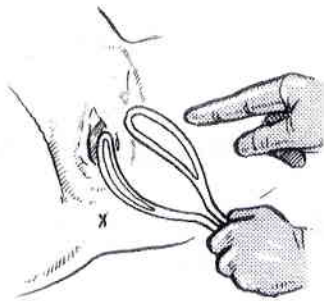
M. distress	F. distress	Power	Passage	Passenger
To prevent straining or to shorten the 2 nd stage → - Heart disease - PET - Chest disease - VBAC	• Prolapsed pulsating cord (with fully dilated cx & engaged head)	• Prolonged 2 nd stage • Weak uterine action	• Minor ^o CPD (some cases) • Rigid perineum	• Malposition:- OP • Malpresentations e.g. - Face - After coming head of breech

Complications of forceps ⇒ ΦΦ

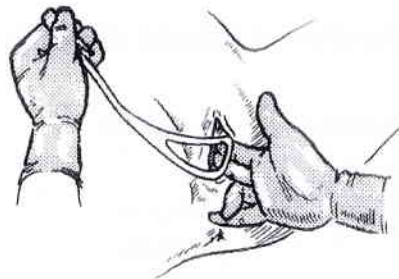
Maternal			Fetal		
Injury	Hge.	Inf.	Injury	Hge.	Death
• Rupture LUS • Cx, vag, perin. tears - Bladder (fistula) - Urethra (SUI) - Ligaments (prolapse) • Pelvic joints, nerves	PPhge:- • Trauma • Atony	Puerp. sepsis	• Lacerated scalp • Fracture skull • Facial nerve • Brachial plexus • Eyes & ears	• Cephal-hematoma • Intra-cranial hge	-Asphyxia- due to compression of the cord between blade & head



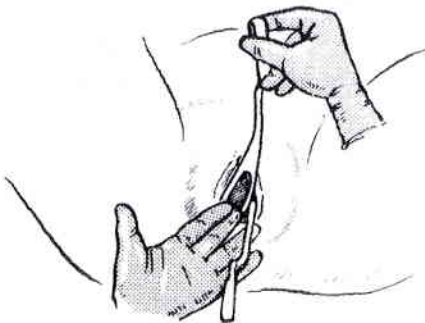
Technique of forceps



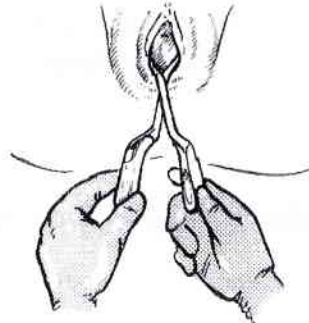
1. Choosing the left blade.



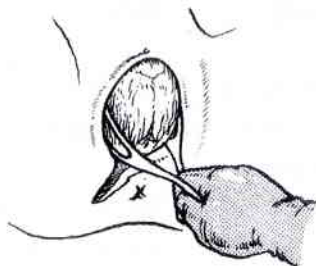
2. Applying the left blade.



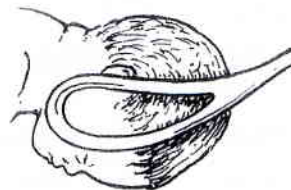
3. Applying the right blade.



4. Locking the blades.



5. Gentle traction with an episiotomy at crowning.



6. The correct cephalic application (in the mento-vertical line).

Prerequisites for forceps application ☐☐

- ☐ Anesthesia → . GEA
 - . Epidural (best) or spinal
 - . Pudendal nerve block
 - ☐ Bladder & rectum evacuated
 - ☐ Complete asepsis
-
- ☐ Cervix → fully dilated
 - ☐ Membranes → ruptured (if intact membranes → may lead to: slipping or premature separation of the placenta)
-
- ☐ Presenting part [☐]
 - Cephalic (vertex or face: MA)
 - After-coming head of breech (position should be suitable)
 - Head → engaged
 - ☐ Pelvis → no CPD or soft tissue obstruction
 - ☐ Uterine contractions should be present (to avoid atonic PPHge)

Technique of forceps delivery in OA position

- ☐ Lithotomy position
 - General or regional anesthesia
 - Sterilization of vulva & vagina (by what?)
 - Catheterization of bladder (why?)
 - EUA → to be sure that all prerequisites are present
- ☐ Apply LEFT blade 1stwhy?
 - Hold in *LEFT* hand
 - Apply in sacral hollow guided by (*right*) hand till fully inserted
 - Rotate the blade to occupy the *LEFT* side
- ☐ Apply RIGHT blade
 - Hold in *RIGHT* hand
 - Apply in sacral hollow guided by (*left*) hand till fully inserted
 - Rotate the blade to occupy *RIGHT* side
- ☐ Lock blades (± axis traction piece; usually not used)
- ☐ Apply traction
 - Intermittent (not more than 25–30 sec) [☐]
 - Gentle
 - In direction of pelvic axis
 - With uterine contractions [☐]
- ☐ Episiotomy is done ✓ (on crowning) [☐]
- ☐ After delivery → explore the genital tract for lacerations (fundo-perineal)

History

Arthur Wrigley (1902–1983) was born in Lancashire and opposed the use of forceps when the fetal head was high. His own forceps, he said, were designed 'so that it is impossible to exert a tremendous pull'.

History

William Neville (d. 1904) and Robert Barnes (1817–1907), both from England, first displayed their forceps at the Obstetrical Society of London in 1867. The forceps were designed to grasp the moulded fetal head at or above the pelvic brim as an alternative to craniotomy or caesarean section.

History

James Young Simpson (1811–1870), from Edinburgh, had a huge impact on obstetric practice. In addition to his forceps, he introduced chloroform to obstetric anaesthesia (quoting Galen with 'pain is useless to the pained') and developed a forerunner to the ventouse.

Klelland's forceps (history box) for rotational delivery to an occipitoanterior or occipitoposterior position. The reduced pelvic curve allows rotation about the axis of the handle.

History

Christian Kielland (1871–1941) was born in Zululand and was of Norwegian descent. His design of straighter forceps permitted head rotation, and he set strict criteria for their use to ensure their safe use.

Results

☆ Elective forceps (Prophylactic forceps)

- Forceps is applied after 20 min from the full cervical dilatation when the head is low → outlet forceps only
- Aim → . ↓ maternal & fetal distress
 - . Protect fetal head from compression
- The principle of prophylactic forceps was 1st put by De-Lee ↻
- It is now generally accepted that if the perineum & coccyx offer the only resistance it is suitable to do prophylactic episiotomy & forceps
 - . Episiotomy is the *commonest* obstetric maneuver
 - . Prophylactic forceps is the *next* common

☆ Trial forceps (Tentative forceps)

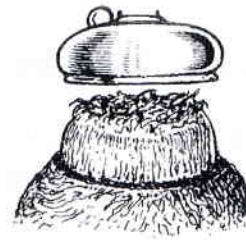
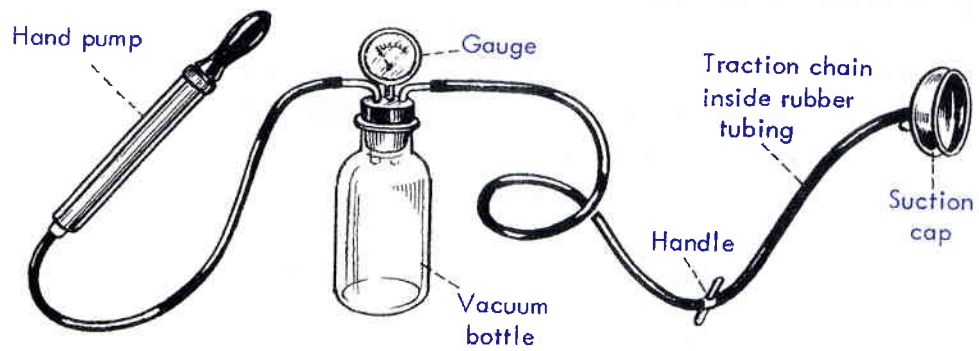
- In *borderline* CPD
- Forceps is applied (keeping in mind that it may not succeed)
- Mild traction is applied → if no descent or resistance
 - remove the forceps → do CS

☆ Failed forceps

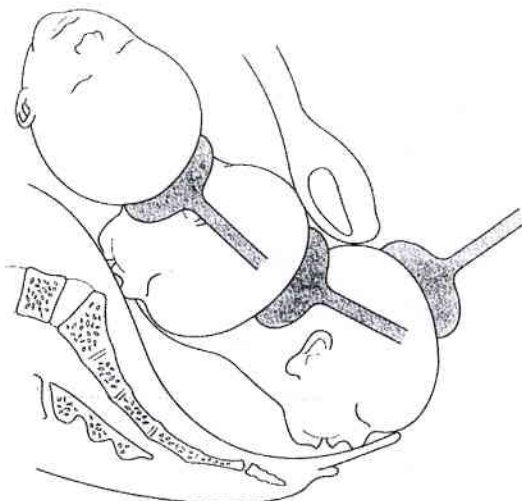
- Failure of the forceps to deliver the head after repeated & persistent attempts
- Very dangerous & may lead to complications
- Etiology (usually undiagnosed):

<i>Pelvis</i>	<i>Fetal</i>
- Bony: Contracted pelvis - Soft tissue: . Contraction ring . Incompletely cx dilat . Pelvic tumor	- Large head . Hydrocephalus . High head (short cord) - Malposition (uncorrected) - Malpresentations (as brow)

- Management
 - Remove forceps → followed by correction of the cause
 - Usually by doing CS (difficult)



The artificial caput made by suction cup immediately after delivery.



The traction plane

The vacuum extractor (Ventouse)

Definition

It is an instrument used to apply traction on the fetal head by suction (negative pressure) through its cup (1st invented by James Yonge -1705)

Parts

1. Cup (silastic or metallic –Malmstrom–)...50 mm
2. Traction piece (chain)
3. Vacuum bottle

Indications (as forceps) but has these advantages:

- May be applied
 - Without anesthesia (esp for cardiac & chest disease)
 - Before full cervical dilatation
 - To high head
 - To non-rotated head
- Less traumatic
 - Esp to maternal tissue [□]
 - No compression of fetal head
 - As it takes less space
 - If excessive force is applied → slip

Contraindications

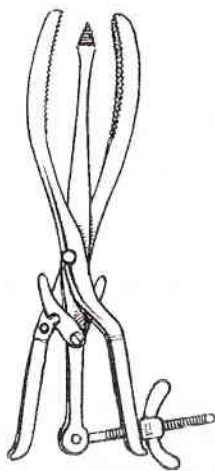
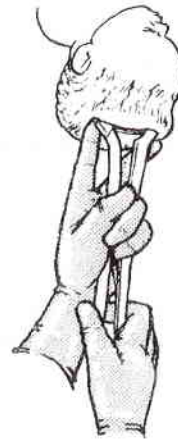
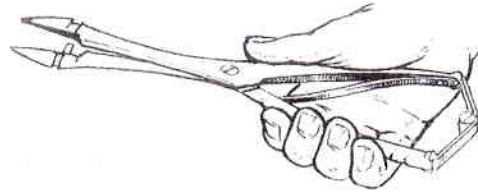
- Non-vertex presentation e.g. face [□]
- Suspected fetal coagulopathy [□]
- Severe fetal distress (takes more time)
- IUFD (no caput will be formed)

Technique

- Sterilization, catheterization, examination
- Apply the largest possible cup near OCCIPUT & raise pressure by $0.2 \text{ kg / cm}^2 / 2 \text{ min}$ to $0.8-1 \text{ kg / cm}^2$
- An artificial caput will form inside the cup
- Rotation + traction are done in the same time
- It is considered failed.....if > 3 pulls or > 15 min. without delivery → CS

Complications

Maternal (less)	Fetal
Injury to: . Cervix . Vagina . Perineum	- Lacerations of scalp - Cephalhematoma - Intracranial hemorrhage - Fracture skull bones



Cranioclast and Cephalotribe

✕ Destructive operations ✕

Definition

These are operations done to ↓ fetal size or diameters to facilitate delivery:-

- Very dangerous & rarely done now (C.S. is safer)
- Done only on dead fetus or major CFMF
- Contraindicated in living non-malformed fetus

Types

Craniotomy

► It means perforation of head to ↓ its size + evacuation of its contents

► Indications

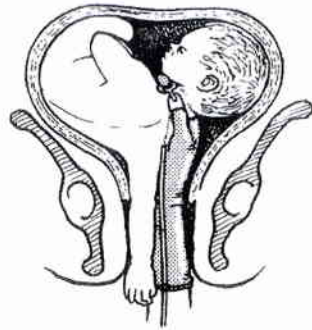
- *Hydrocephalus* (main indication) → may perforate with spinal needle → escape of CSF → ↓ size of head
- *Retained aftercoming head of breech*
- *Contracted pelvis*

► Technique

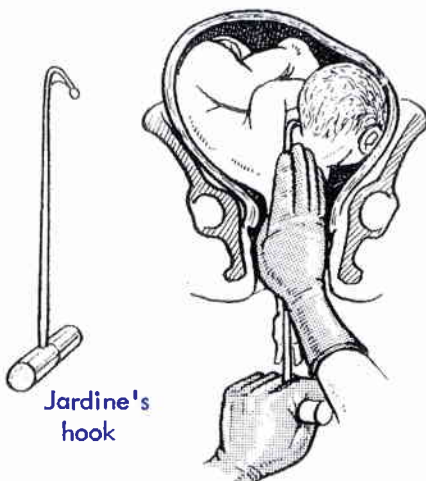
- GEA, sterilization, catheterization
- Examination under anesthesia
- Fix the head by assistant's hand or forceps
- Use Oldhams or Simpson perforator → introduce while guarding blade with hands
 - push blades to shoulders & open
 - repeat at right angles
- Introduce perforator inside the brain to destroy brain matter or wash away by Bozeman catheter
- Deliver the head by . Forceps → difficult
 - . Volsellum or Willett scalp forceps
 - . Cranioclast & crush face
 - . Combined cranioclast & cephalotribe
 - . Crochet to aftercoming head of breech
- Exploration of the genital tract

► Complications (maternal)

- Injuries (uterus, cervix, vagina, perineum, bladder, rectum)
- Hge & infection
- Fistulae



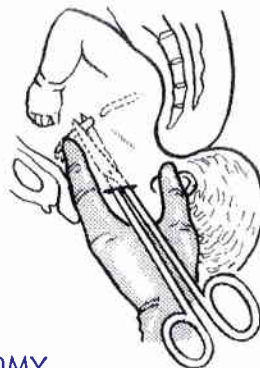
Using the Blond-Heidler Saw



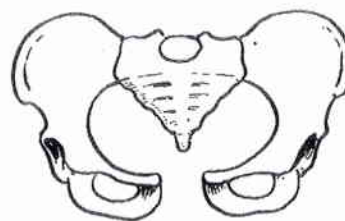
Jardine's
hook

DECAPITATION

Using a Decapitation Hook



CLEIDOTOMY



SYMPHYSIOTOMY

Decapitation

- ▶ **It means** cutting the neck to separate head from body
- ▶ **Indications**
 - Neglected shoulder
 - Locked twins
 - Double headed monster
- ▶ **Technique**
 - GEA, sterilization, catheterization
 - Examination under anesthesia
 - Fix neck by pulling arm to be nearer
 - Decapitation hook
 - . **Braun** → to fracture cervical spine then cut with embryotomy scissors
 - . **Ramsbotham** (sharp)
 - . **Galabin** (serrated)
 - Delivery of the trunk by traction
 - Delivery of the head by forceps, cranioclast, or jaw traction
 - Explore genital tract

Cleidotomy

- ▶ **It means** cutting one or both clavicles
- ▶ **Indications**
 - Shoulder dystocia (may be done on living)
 - Some cases of neglected shoulder

Evisceration

- ▶ **It means** opening of thorax or abdomen & removal of fetal viscera
- ▶ **Indications** obstructed labor due to →
 - Thoracic swellings
 - Abdominal swellings
 - Some cases of shoulder dystocia

Spondylotomy

- ▶ **It means** division of fetal spine
- ▶ **Indications** some cases of neglected shoulder when neck is not in reach)

ENTONOX

(50% oxygen, 50% nitrous oxide) is the most popular and is inhaled through a mask attached to a cylinder.



-- Analgesia during Labor --

Differences between obstetrical & surgical analgesia:

- Drugs pass the placenta → neonatal resp. depression
- Duration of analgesia may be required for ≥ 12 hours
- Drugs should exert little or no effect on → uterine contractions
- Labor occurs at any time (emergency) → aspiration of gastric contents (Mendelson syndrome)....the commonest cause of anesthetic death.....Prophylaxis:
 - . Fasting for at least 6 hrs if possible
 - . Reduce gastric acidity (cimetidine) before operation

① Narcotics:

- *Pethidine* → 50–100 mg IM / 3–4 hrs. It may lead to neonatal depression if delivery occurred within 2 hrs → Naloxone HCL (Narcan)
- *Meperidine* (Demerol).....*Butorphanol* (Stadol).....*Nalbuphine* (Nubain)

② Tranquilizers

- *Diazepam* (Valium) → 5–10 mg I.M. / 4 hrs
- *Promethazine* (phenergan)
- *Promazine* (Sparine)

③ Inhalation analgesia (Entox)

- *Nitrous oxide* (50%) & O_2 (50%) → during 2nd stage

-- General anesthesia --

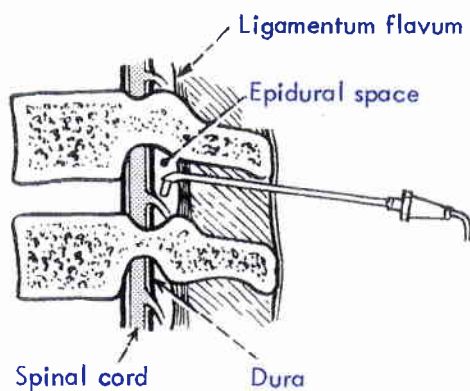
① Inhalation anesthesia

- *Entonox* → $NO + O_2$
- *Halothane* (Fluothane) → remarkable uterine relaxation
- *Isoflurane* (Forane) → esp. if there is possible halothane hepato toxicity

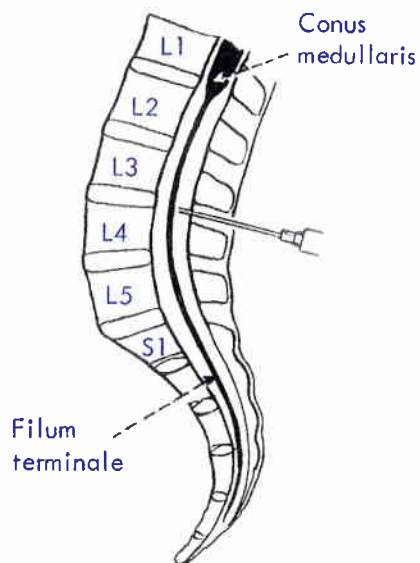
② Intravenous drugs

- *Thiopental* (Pentothal) is used in conjunction with other agents
- *Succinyl choline* (a muscle relaxant) is given just prior to tracheal intubation

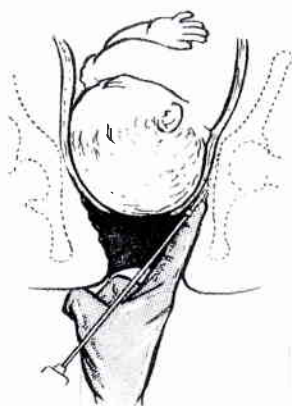
EPIDURAL ANAESTHESIA



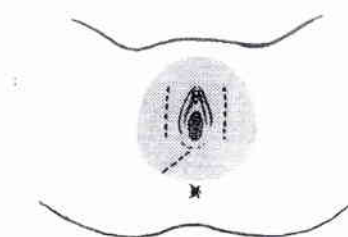
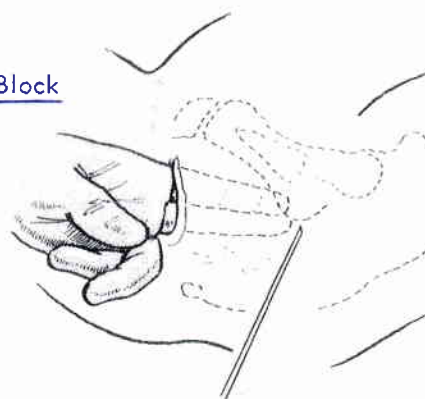
SPINAL ANAESTHESIA



Pudendal Nerve Block



PARACERVICAL NERVE BLOCK (PCB)



Area of vulva and perineum which should be infiltrated.



Principal nerves supplying vulva and perineum.

-- Regional anesthesia --

① Spinal (Subarachnoid) anesthesia

► Complications:-

- Hypotension
- Total spinal blockade with respiratory paralysis
- Spinal (post-puncture) headache due to leakage of CSF
- Bladder dysfunction: esp for the 1st few hrs after delivery
- Meningitis

► Contraindications

- Obstetric complications associated with hypotension
- PET (as the patient is very sensitive to sudden fall of B.Pr.)
- Disorders of coagulation and defective haemostasis

② Epidural anesthesia

► Types

- *Continuous lumbar epidural block* (from T₁₀ – S₅). Addition of small doses of a short-acting narcotic (fentanyl) improves analgesic efficacy
- *Caudal Analgesia* → infrequently used today

► Complications:

- Epidural block may lead to delay or failure of descent of the presenting part → increased incidence of forceps or CS

③ Paracervical block

- Lidocaine 1% → 5–10 ml injected at 3 & 9 o'clock into the paracervical tissues on both sides of the cervix

④ Pudendal block

- Lidocaine 10 ml 10% is injected at the tip of the ischial spine
- It is extremely safe & simple method for spontaneous delivery, forceps vacuum extraction

⑤ Non-pharmacological methods

- Antenatal classes → relieve of fear & psychological preparation
- Acupuncture